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GENERAL STUDIES (TEST CODE : 1244)

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Center	DELHI	Date	27/08/2019

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	10	
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4	10	
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11	15	
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15	15	
16	15	
17	15	
18	15	
19	15	
20	15	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
   उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न–पत्र कोड, विद्यार्थी क्रमांक आदि)।
2. There are **TWENTY** questions printed in **ENGLISH & HINDI**
   इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
3. **All questions are compulsory.**
   सभी प्रश्न अनिवार्य हैं।
4. The number of marks carried by a question/part is indicated against it.
   प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other that the authorized one.
   प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न–सह–उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
6. Word limit in questions, if specified, should be adhered to.
   प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
   उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।

EVALUATION INDICATORS

1. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

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1. Discuss the need of an Independent Fiscal Council (IFC) in bringing about transparency and accountability in fiscal processes in India. **(150 words) 10**

भारत में राजकोषीय प्रक्रियाओं में पारदर्शिता और जवाबदेही का समावेश करने हेतु एक स्वतंत्र राजकोषीय परिषद (IFC) की आवश्यकता की चर्चा कीजिए।

Recently, N.K. Singh headed 15th Finance commission, recommended about constituting an independent fiscal council in India, looking at the success of such councils in USA and UK.

IFC role in bringing transparency:

→ IFC will provide a sustainable definition of 'public debt', thus making the budgetary process and extra-budgetary borrowings clear.

→ Provide technical support and analysis in budgeting and accounting.

→ Chart out a medium term and multiple year fiscal policy for the centre.

IFC role in bringing accountability:

→ Unlike Public Accounts committee, and CAG's audit reports, it will keep 'real time' tab on government

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expenses, thus ensuring accountability.

→ Analyse the fiscal consolidation and expenditure, thus keeping a check on populist measures.

→ By making budgeting an open, inclusive, participatory process, it leads to wide public discourse also.

→ An independent fiscal council with sectoral experts will ensure the working according to Fiscal Responsibility & Budget Management Act, being in clear actions and goals towards inclusive development and economic growth.

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2. Recognizing the potential of exports in generating employment, a number of steps need to be taken to address India's weakening export competitiveness. Analyze. **(150 words) 10**

रोजगार सृजन हेतु निर्यात क्षेत्र की क्षमताओं की पहचान करते हुए, भारत की कमजोर होती निर्यात प्रतिस्पर्धा को संबोधित करने हेतु कई कदम उठाए जाने की आवश्यकता है। विश्लेषण कीजिए।

Exports are one of the most potent mediums for economic growth and wide scale employment generation. India's share in world exports is meagre 1.6% as compared to China's share of 13.6%.

Potential of Exports in generating employment

↳ India being agrarian economy, can lead to remunerative jobs in rural areas by focusing on export of high value agricultural items.

↳ Using the economies of scale and aggregation of industries, exports help in increasing productivity and further labour intensive employment.

↳ India can capture dwindling export market from China & Japan, in sectors of apparel, silk, footwear, electronics

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and lead to more labour intensive employment.

↳ Exports help in developing forward, backward linkages, thus acting as propulsive industries, with more multiplier effect & employment.

Current problems in India's exports:

→ competitiveness is an issue → Vietnam, Bangladesh with cheap labour and production from Tier II, Tier III cities.

→ Phytosanitary standards in various agro products.

→ Export is dependent on crucial imports like crude oil, gems, thus becomes expensive.

Steps to be taken:

↳ SEZ, NIMZ, Coastal Economic Zones should be promoted as employment and economic enclaves.

↳ Provide incentives to start ups, patenting flexibilities.

↳ Sagarmala, Bharatmala, UDAN and Inland Waterways should lead to more inter-modal connectivity.

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3. Highlighting the main features of National Mineral Policy, 2019, discuss how it can help in ensuring sustainable and responsible mining.
(150 words) 10

राष्ट्रीय खनिज नीति, 2019 की मुख्य विशेषताओं पर प्रकाश डालते हुए, चर्चा कीजिए कि यह संधारणीय और उत्तरदायित्वपूर्ण खनन सुनिश्चित करने में कैसे सहायता कर सकती है।

National Mineral Policy, 2019 aims to boost mining activities, make it sustainable and profitable.

Features:
- District Mineral fund to be adequately utilised
- opening Mineral corridors for more private investment
- mining declared as industry, to allow purchasing & mining in foreign lands.
- long term import-export policy for stability

How will it help in sustainable and responsible mining:

↳ By talking of 'intergenerational equity' it focuses on sustainable mining processes.

↳ Mining export zones will lead to dedicated blocks which will lead to rational utilisation of mines.

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↳ Providing fair level field to the private players with adequate safeguards and incentives.

Use of technology, robust mining methods will help India make net exporter of minerals, leading to reduced current account deficit and a further boost to Make In India.

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4. Highlighting the salient features of the PM JI-VAN Yojana, analyze how it can assist in achieving the vision and goals of the National Policy on Biofuels, 2018. **(150 words) 10**

"प्रधानमंत्री जी-वन योजना" की मुख्य विशेषताओं पर प्रकाश डालते हुए, विश्लेषण कीजिए कि यह जैव ईंधन राष्ट्रीय नीति, 2018 की दृष्टि और लक्ष्यों को प्राप्त करने में किस प्रकार सहायक हो सकती है।

PM-JIVAN yojana is a flagship scheme aiming at:

- sustainable rural development and employment options
- reducing environmental pollution and achieve INDC targets.

Salient features of PM JIVAN

- Reach 10% ethanol blending in petrol goal
- boost to 2G-bioethanol plants
- procurement of raw material from farmers & FPOs.
- use of cellulo-lignose, molasses, waste to produce ethanol.

PM JIVAN yojana is much in tandem with National Biofuel Policy, 2018:

⇒ Biofuel Policy focuses on development of advanced biofuels (second generation and onwards) → which is supported by JIVAN yojana.

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→ Policy allows the usage of non food materials, wasted food crops, cellulo-lignose, algae etc, which is also a feature of JIVAN yojana.

→ Both the initiatives aim to decrease the GHG ~~&~~ emission reduction, and quick achievement of INDCs.

→ Biofuel policy provides 6 years of viability gap funding to 2G ethanol plants, which will help the establishment of plants in JIVAN yojana.

Thus both these policies help move towards ~~a~~ reduced import bill, more energy security and efficiency.

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5. Zero Budget Natural Farming (ZBNF) provides an alternative to capital and chemical intensive agriculture currently being practiced in India. Analyze. **(150 words) 10**

जीरो बजट प्राकृतिक कृषि (ZBNF), भारत में वर्तमान समय में प्रचलित पूंजी और रसायन गहन कृषि का एक विकल्प प्रदान करती है। विश्लेषण कीजिए।

Zero budget natural farming is a way of farming utilising all the natural inputs and focusing towards a sustainable agricultural model.

Current Agriculture practiced in India

fig: The map portrays crops grown with excess of inputs leading to disparities and pollution

How is 0 Budget Natural Farming an Alternative:

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→ Use of manure, compost, vermiculture ~~for~~ as substitute for fertilisers.

→ Focus on zero tilling, mulching to reduce weeds, irrelevant mechanised soil operations leading to soil erosion.

→ Integrated Pest Management, natural predators to remove pests and invasive species

Challenges
- land fragmentation issue
- need to scale it up to meet rising food demands
- awareness among farmers.

Thus agro climatic planning based O budget natural farming would solve the agricultural distress due to credit & productivity issues.

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6. Marine life is facing 'irreparable damage' from the millions of tonnes of plastic waste which ends up in the oceans each year. In this context, examine the implications of plastic pollution on marine ecosystem and suggest some measures for addressing this problem. **(150 words) 10**

समुद्री जीवन, प्रति वर्ष समुद्र में पहुँचने वाले लाखों टन प्लास्टिक कचरे के कारण 'अपूरणीय क्षति' का सामना कर रहा है। इस संदर्भ में, समुद्री पारिस्थितिकी तंत्र पर प्लास्टिक प्रदूषण के प्रभाव का परीक्षण कीजिए और इस समस्या के समाधान हेतु कुछ उपाय सुझाइये।

The Great Pacific Garbage Patch in northern Pacific Ocean has raised the concern of increasing plastic pollution in oceans.

Implications of Plastic Pollution on marine ecosystem:

→ Several keystone ecosystems like coral reefs, kelp forests are losing their biodiversity due to intense plastic pollution.

→ Plastics and microbeads are leading to bioaccumulation and biomagnification ultimately affecting humans too.

→ Causing severe decline of endangered benthic and nektic fauna.
eg Dugong in Gulf of Mannar.

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How to address the problem?

→ Initiatives like 'Beat Plastic Pollution', 'End Plastic Pollution' have to be adopted globally.

→ Global participation in clearing and cleaning seas and oceans.

→ Ban on plastics below certain size, eg 50 microns in India, and microbeads use in cosmetics should be regulated.

→ International organisations like UNCLOS, International Seabed Authority need to come up with comprehensive framework.

Global collaboration is the only key to protect & preserve the global commons.

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7. Write a short note on the evolution of Bharat Stage norms in India. Also discuss the significance and challenges posed by the planned introduction of BS-VI norms in India from the year 2020. **(150 words) 10**

भारत में भारत स्टेज मानकों के विकास पर एक संक्षिप्त टिप्पणी लिखिए। साथ ही, वर्ष 2020 से भारत में BS-VI मानकों को योजनाबद्ध रूप से लागू किए जाने के महत्व और उसमें आने वाली चुनौतियों की भी चर्चा कीजिए।

Bharat stage norms in India are a step towards making India green and a sustainable economy.

Evolution of Bharat stage Norms

- Evolved in 1991, in line with euro Norms of controlling vehicular emission
- Since then, it adopted successive series of Bharat Stages, and currently we are in BS IV.
- BS V was to start from 2020, but it was overstepped with BS VI norms
- BS VI started in NCR from April 2018, and in rest of India from 2020.

Significance of BS VI norms

- reduce NOx emissions by about 25-70%.
- reduce sulphur emission to upto 10 ppm, as opposed to 50 ppm in BS IV
- decrease $PM_{2.5}$ and PM_{10} by 25%.
- make the producers liable to insure to reveal all details to consumers

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Challenges posed by quick introduction:

↳ Skipping BS V will not provide adequate time to manufacturers to cut down on cost, and develop new features.

↳ Rising cost due to new design will hurt consumers.

↳ Significant changes in fuel required by oil marketing companies

↳ The old inventory of already manufactured will lead to additional losses.

BS norms are one of the successful approaches of government and involves participation of all stakeholders. Proper incentives to companies would ease easy transition.

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8. What are black holes? Highlight the challenges in imaging a black hole? How were these challenges overcome by the Event Horizon Telescope project? **(150 words) 10**

ब्लैक होल क्या हैं? ब्लैक होल के चित्रण (इमेजिंग) में आने वाली चुनौतियों पर प्रकाश डालिए। इवेंट होराइज़न टेलीस्कोप प्रोजेक्ट द्वारा इन चुनौतियों को कैसे दूर किया गया?

Black holes are celestial phenomena which are formed by decline/death of stars. They are characterised by ultra high gravity, not even light can escape it.

Challenges in imaging black hole:

⇒ Since light and even most of the wavelengths of the waves in the visible, UV, infrared range cannot escape, it makes practically difficult to map and image them with conventional telescopes.

⇒ Moreover, even the gravitational waves created by black holes are difficult to identify and understand.

Event Horizon Telescope Project:

The project is a collaboration of several countries with an aim to image black holes. The different technique used is:

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Very long baseline interferometry.

Operationalisation of Technique:

- It is composed of many radio telescopes facilities around the world.
- They work towards to produce highly sensitive telescope.
- Signal from a source is collected at multiple stations, and distance between telescopes is calculated using the time difference.

Thus, such best know technique in distant source mapping will help ~~will~~ in imaging black hole.

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9. While mentioning the objectives of the Arms Trade Treaty (ATT), discuss the challenges which are hindering the utilization of the ATT to its full potential. **(150 words) 10**

शस्त्र व्यापार संधि (ATT) के उद्देश्यों का उल्लेख करते हुए, उन चुनौतियों की चर्चा कीजिए जो ATT को इसकी पूर्ण क्षमता से उपयोगित किये जाने में बाधक हैं।

Arms Trade Treaty deals with conventional weapons and reduce illicit weapon trading.

Objectives :

Sale of weapon linked to human rights violations records of buyers, thus establishing responsible use.

Seeks to control the conventional weapons falling to terrorists, criminal groups,

Evaluate arms dealers with their credibility,

Challenges:

- Not ratified by many countries.
- Does not regulate domestic sale in a country.
- Illegal arms trade linked with Hawala is prevalent.
- US backing off from the treaty.

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A global consensus needs to be build for a sustainable, responsible world structure. Arms trade treaty should not be seen in isolation, comprehensive solutions like alienating terror-supporting countries, listing international terrorists at UN, will ensure a peaceful world order.

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10. Threats to internal security of India may be posed both through the communication networks and also to the networks. Discuss. Also, highlight the steps taken by the government in making the networks more secure.

(150 words) 10

भारत की आंतरिक सुरक्षा को खतरा संचार नेटवर्कों के माध्यम से एवं स्वयं संचार नेटवर्कों को खतरा होने, दोनों ही प्रकार से हो सकता है। चर्चा कीजिए। साथ ही, नेटवर्कों को अधिक सुरक्षित बनाने हेतु सरकार द्वारा उठाए गए कदमों पर प्रकाश डालिए।

with growing fourth industrial revolution and technological breakthrough, new theatres of internal security threats have opened up.

Threat to Internal security is double edged

communication networks as new areas of thread

⇒ Recent New Zealand church attack was livestreamed, showing the spread of targets.

⇒ so social media, digital platforms provide
- anonymity
- accessibility
- undiscovered source of action
- action from distance

⇒ eg cyber terrorism in Jammu & Kashmir, increasing lone wolf attacks.

How networks are threatened

⇒ Telecom networks form the basis of critical infrastructure
eg tapping of BSNL network by Pakistan

⇒ Hacking, phishing, cyber warfare.
eg Petya, Saposhi malwares attacked cyber systems

⇒ Stuxnet example shows vulnerability of networks

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With ~~every~~ 1 attack on cyber space in every 10 minutes, shows the vulnerability of cyber security in India.

Steps taken by government:

⇒ National cyber critical information infrastructure protection council to protect space, telecom and nuclear structures.

⇒ Cyber warfare police force and Indian cyber crime coordination centre to look into rising cyber issues.

⇒ Maharashtra has developed a dedicated cyber police cell.

⇒ National cyber coordination centre to check the incoming cyber information in country.

With discussions towards joining Budapest convention and hosting 5th Global Cyber Space conference, India is actively moving towards protecting networks.

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11. Highlight the importance and challenges related to integration of Variable Renewable Energy (VRE) in India. Mention some steps that can be taken for its smooth integration with the synchronized Indian grid. **(250 words) 15**

भारत में परिवर्तनीय नवीकरणीय ऊर्जा (VRE) के एकीकरण के महत्व और इससे संबंधित चुनौतियों पर प्रकाश डालिए। ऐसे कुछ कदमों का उल्लेख कीजिए जो समक्रमिक (सिंक्रनाइज्ड) भारतीय ग्रिड के साथ इसके सहज एकीकरण के लिए उठाए जा सकते हैं।

Variable Renewable energy includes those energy resources which are renewable but their supply is variable and intermittent.

Importance of Variable Renewable Energy:

- India being tropical country, abounds in solar energy,
- National Institute of Wind energy has estimated wind energy potential of 302 GW by increasing wind mill heights to 100m.
- Help in achieving the INDC of 175 GW by 2022.
- Reduce the import dependence of coals and plug the demand-supply mismatch.
- Integration in the national grid will improve energy security, being in competitive pricing structures.

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Challenges with Variable Renewable Energy

- DISCOMs are already suffering with financial crisis. Generators also facing challenges. Thus, low prices decreases further viability
- problems of incorporation in the national grid
- solar and wind energy are concentrated at some places, thus connection & distribution brings problems.
- Fluctuating supply creates problem & confusion in conventional energy generation.

Steps to be taken to simplify & streamline the integration of Renewable Energy to National grid:

↳ Smart meters with real time 2 way communication will help in assessing the demand and supply.

↳ Renewable purchase obligations, bid-in-tariff, must run status will ensure that renewable energy is procured continuously.

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↳ Smart grid, green energy corridors should go through the surplus states, with facility of energy saving certificates to the deficient states to maintain parity.

↳ Rooftop solar, offshore wind installations should be further boosted.

Renewable energy is the future of India's energy ~~sc~~ scenario. Gradual, seamless integration will ensure a greener, developed India.

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12. There have been arguments that India could fall into a 'middle income trap'. Explaining the phenomenon, highlight the reasons behind such arguments. How can India avoid it? **(250 words) 15**

ऐसे तर्क दिए गए हैं कि भारत 'मध्यम आय पाश' में फंस सकता है। इस परिघटना की व्याख्या करते हुए, ऐसे तर्कों के लिए उत्तरदायी कारणों पर प्रकाश डालिए। भारत इससे किस प्रकार बच सकता है?

Economic Survey 2017-18, has warned India of falling in middle income Trap.

Middle Income Trap
↓
A situation in which an economy is

- not able to compete with cheap manufactured products from low income countries
- unable to scale up innovative, skilled productivity like the developed countries.

Why is India vulnerable to falling in trap?

↳ India's 'average age' by 2022 would be 28, the youngest nation of world, still only 2% workforce is skilled & 5% population has got technical education, thus unable to tap demographic dividend.

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↳ Agriculture still employing about 49% of population and manufacturing not able to take off. Still the goal of 25% manufacturing GDP by 2025 seems difficult.

↳ In wake of global slowdown, poor productivity and lack of economies of scale, has slowed down the export potential.

↳ underemployment, poverty, income inequality all force towards making India fall in trap.

↳ lack of industry-academia linkage, poor job quality.

How to avoid it?

→ Innovation conducive policies : Digital India, Make In India, Atal Innovation Mission, Start Up India.

→ Boost manufacturing by → labour intensive industries (apparel, footwear etc)
→ formalise the MSME sector.

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→ Move towards knowledge economy and focus on specialisation, like South Korea's electronics.

→ Increase investment in social infrastructure – health, education. ~~Make~~ start vocational education from school level, and impart skill training.

→ Provide the incentives to Coastal Economic Zone, SEZ, National Infrastructure & Manufacturing Zone for faster operation.

→ Solve Twin Balance sheet issue of financial sector.

All these steps will help India move towards a better, faster inclusive growth driven economy.

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13. Highlighting its importance, discuss the major issues that plague effective monetary policy transmission in India. Also, mention the steps taken by RBI to improve it. **(250 words) 15**

भारत में मौद्रिक नीति संचरण के महत्व पर प्रकाश डालते हुए, उन प्रमुख मुद्दों पर चर्चा कीजिए जो इसकी प्रभाविता को बाधित करते हैं। साथ ही, इसमें सुधार के लिए RBI द्वारा उठाए गए कदमों का उल्लेख कीजिए।

Effective Monetary Policy Transmission is a procedure through which any rate cuts, interest rate changes initiated by RBI are followed by all the banks of country.

Importance
- helps in financial inclusion, increased private investment
- Increases investor confidence, better functioning of monetary policies
- ensures efficient economic growth, ensuring transparency in functioning, reducing chances of corruption.

Issues with effective transmission

↳ Banks do not allow quick rate cuts, but quickly implement rate hikes because:
- Double financial repression of CRR & SLR
- Priority sector lending bounds their choices in lending
- Increasing NPAs and liquidity crunch.

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- Operational inefficiency and scope for corrupt practices increases.
- Provisioning for credit risk, high capital adequacy ratio also inhibits their liquidity status.

Steps taken by RBI:

- Change from Base Rate to Marginal cost of funds based lending rate, which has included repo rate has brought great deal of transmission.
- Liquidity swapping of $25 bn for 3 years has increased liquidity of banks.
- Removal of all loan structuring features like – S4R, SRA etc with the Insolvency & Bankruptcy code brought by Parliament.
- But MCLR has been known to certain inefficiencies as pointed by Janak Raj committee, thus need to shift to an external benchmark rate.

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Monetary Policy Transmission, if effective will lead to multiplier effect in economy with increased savings and investments.

Don't write anything this margin (इस भाग में कुछ ना लिखें)

14. Highlight the constraints faced by rainfed agriculture in India. Discuss some agronomic practices that can be adopted for stabilizing agricultural production in rainfed areas. **(250 words) 15**

भारत में वर्षा सिंचित कृषि में आने वाली बाधाओं पर प्रकाश डालिए। वर्षा सिंचित क्षेत्रों में कृषि उत्पादन को स्थायित्व प्रदान करने हेतु अपनाई जा सकने वाली कुछ कृषि-वैज्ञानिक पद्धतियों की चर्चा कीजिए।

About 52% of gross cropped area in India is rainfed. Rainfed agriculture pertains to type of agriculture which has no means of formal irrigation system and depends on rainfall.

Constraints faced by Rainfed Agriculture

↳ with 70% pulses, oilseeds
90% millets
100% tobacco
grown in this agriculture, it is the least developed.

↳ Rainfed agriculture is marred by institutional problems like:

- 86% of majority of small and marginal farmers belong here
- land fragmentation
- inadequate inputs
  ↳ seeds, fertilisers, irrigation system

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↳ Pricing is a big issue, with lack of monetary support & procurement, rainfed agriculture is now facing desertification, chronic fallowing.

↳ Lack of forward & backward linkages, like no roads, warehouses, cold chains, APMCs far away, poor research in HYVs of rainfed crops, all has led to deterioration of rainfed agriculture.

fig: extent of rainfed agriculture in India

Agronomic practices can be

- biotic
- mechanical

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Biotic Agronomic Practices
- crop rotation
- use of integrated farming system
- natural compost as manure
- integrated pest management
- agro-climatic cropping

Mechanical Agronomic Practices
- rainwater harvesting
- mulching with crop waste
- zero tillage
- Terracing, shelter belts
- contour bunding and cropping
- deep sowing methods
- watershed development

Besides such methods, focus be made on income augmentation through allied activities, like:
- agroforestry in Bundelkhand
- mud crab farming in Odisha & Tamil Nadu.

With PM ~~Kis~~ Krishi sinchayee Yojana, PM Fasal Beema Yojana, rainfed agriculture can grow remuneratively.

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15. Despite the steps taken by the government in recent years, a number of problems continue to persist in the urea sector in India. Discuss. What reforms should be taken to address the persisting problems?

(250 words) 15

हाल के वर्षों में सरकार द्वारा उठाए गए कदमों के बावजूद, भारत में यूरिया क्षेत्र में कई समस्याएं निरंतर बनी हुई हैं। चर्चा कीजिए। मौजूदा समस्याओं के समाधान हेतु क्या सुधार किए जाने चाहिए?

In an agrarian country like India, urea sector holds utmost importance, several steps taken by the government:

↳ 100% neem coated urea to check smuggling to Nepal and Bangladesh

↳ Soil Health Card scheme to aware farmers about rational use of urea and other fertilisers.

↳ cannalisation of urea ~~disrupts~~ to check ~~con~~ black marketing

↳ government's aim to reduce consumption of urea by half by 2022. This has already been achieved by several villages of Himachal Pradesh,

↳ Renewal of 3 fertiliser plants - Barauni, Bihar, Gorakhpur, UP, Sindri

Still various problems plague urea sector,

↳ unawareness among farmers regarding judicious use, instead of 4:2:1, 6.4:4.2:1 is the N:P:K ratio.

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↳ Urea not a part of 22 nutrients based scheme, it is still a part of retention based scheme.

↳ lack of industrialisation, outdated plants, cartelisation has disrupted competitiveness.

↳ lack of domestic capacity, huge cost of import bill

Reforms to be taken further:

↳ India should secure more LNG contracts on long term basis outside India, and establish industries there to ~~see~~ infuse economies of scale.

↳ Cannalisation of urea has outlived its purpose, thus move towards decannalisation.

↳ It should be brought under nutrient based scheme, any political inhibition should be removed.

↳ Information, Education, ~~Commuss~~ communication among farmers.

↳ Modernisation of all fertiliser plants

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~~into~~ based on gas fuels to reduce cost of production and guarantee sustainability.

With 52-55% people still under agriculture, urea holds utmost importance. ~~It~~ A low cost, high productivity urea sector is a sure roadmap towards doubling farmers income by 2022.

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16. What is Access and Benefit Sharing? Explain how it aids in sustainable use of biodiversity. Also, mention the different global and national level mechanisms for ensuring Access and Benefit Sharing. **(250 words) 15**

पहुंच और लाभ साझाकरण (एक्सेस एंड बेनिफिट शेयरिंग) क्या है? यह जैव विविधता के संधारणीय उपयोग में किस प्रकार सहायक है, स्पष्ट कीजिए। साथ ही, पहुंच और लाभ साझाकरण सुनिश्चित करने हेतु वैश्विक और राष्ट्रीय स्तर की विभिन्न प्रणालियों का उल्लेख कीजिए।

Access and Benefit sharing is a global sustainable principle of using the biodiversity sustainably and also sharing the profits with all the stakeholders including the natives from where the biotic material was extracted.

Access and Benefit Sharing (ABS) is an important principle of convention of Biological Diversity and its further mechanisms like - Nagoya Protocol, Aichi Biodiversity targets.

Several national level mechanisms have also been established like:
- → Conservation of Biological Diversity Act, 2002
- → Forest Rights Act, 2006 giving the

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traditional forest dwellers rights over forest produce.

↳ Patenting on agricultural produce to farmers.

↳ several mechanisms to check smuggling and ~~cop~~ patent fringing.

eg Wildlife crime control Bureau's operation save Kurma.

GI tags to indigeneous products.

How it aids in sustainable use of biodiversity?

→ current levels of technological advancement has led to exploitation of biodiversity and human rights by the developed countries and multi national companies.

eg an European company used medicinal plant from Africa for fat reduction and cosmetic use, but did not share it with the natives.

→ All the traditional, endemic gene pool centres are already exploited

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as seen in case of increasing biodiversity hotspots.

↳ By ensuring rights of all, indiscriminate use will be discouraged.

↳ It will help in achieving various global targets of increasing biodiversity

Thus, access and benefit sharing ensures just, equitable and sustainable development of economy along with biodiversity. This is in tandem with SDG 14 and 15.

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17. Stating the significance, discuss the challenges in achieving disaster resilience of infrastructure. Suggest some ways for mainstreaming it in the development paradigm. **(250 words) 15**

अवसंरचनाओं का आपदाओं के प्रति सुनम्य (रेजिलिएंट) होने के महत्व को स्पष्ट करते हुए, इससे संबंधित चुनौतियों की चर्चा कीजिए। इसे विकास प्रतिमान की मुख्यधारा में लाने हेतु कुछ उपाय सुझाइये।

Disaster resilient infrastructure means the capacity to absorb and withstand shocks and disasters without any tangible loss to economy, life and livelihood.

Significance of disaster resilient infrastructure

↳ around 82% of population living in urban areas ~~toovo~~ today is vulnerable to climate related disasters.

↳ ~~Infrastru~~ Physical and social infrastructure resilience helps in adapting and mitigating any disaster risks.

↳ World Bank has estimated 770 mn ppl will fall down in poverty by 2080 due to disasters, this can be prevented using resilient infrastructure.

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→ Role of disaster resilient infrastructure is ~~to~~ in both:

Pre Disaster

- helps develop preparedness
- strong resilient, buildings can house several people during any emergency
- Early warning forecasts

Post Disaster

- reconstruction and rehabilitation work is reduced
- economic loss is minimal
- critical infrastructure ensures quick return to normalcy.

Challenges:

- already overburdened slums, sprawls, poor drainage systems make it difficult for renewal and renovation.
- High upfront cost and capital investment deters creation of resilience.
- corruption, weak governance.
- low awareness among people, lax attitudes, lack of planning.

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How to mainstream in development paradigm

↳ All new construction should be based on proper ~~engin~~ engineered procedures and innovations.

↳ Focus on urban renewal, reducing encroachments, make way for proper drainage solutions and wetlands.
eg Gorakhpur storm drainage, Surat's Ukai dam renewal.

↳ Proper solid waste management, treatment, flood & ~~eq~~ earthquake proof zoning.

↳ Early warning systems with accurate forecasts.

~~Infrastru~~ Infrastructure resilience can come with political will, healthy functioning governance institutions and public participation.

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18. Highlighting the significance of data localization for India, discuss various challenges associated with data localization. **(250 words) 15**

भारत के लिए डेटा के स्थानीयकरण के महत्व पर प्रकाश डालते हुए, डेटा के स्थानीयकरण से जुड़ी विभिन्न चुनौतियों की चर्चा कीजिए।

Data localisation refers to limiting the export of national data to servers based outside India by various state and non state actors.

Significance of data localisation in India

↳ Data is the new factor of production. With growing 4th Industrial Revolution, it becomes important to own our data.

↳ Data from each sector if analysed well will lead to evidence based policy making, thus helping in governance.

↳ Strategic interests lies in maintaining sovereignty over data in national interest & security.

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↳ Manipulation of citizens by misusing data.
eg Cambridge Analytica case in US elections.

↳ Data localisation will help us develop our indigeneous research and development, move towards innovation and knowledge economy.

Challenges associated with data localisation:

↳ lack of a central/nodal legislation.
↳ lack of infrastructure in terms of servers, big data processing capability, cloud computing in storing data.
↳ Skilled manforce is another issue.
↳ Talks over infringement of data privacy and surveillance.

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In such a scenario, Justice B.N. Srikrishna recommendations, and test of proportionality as recommended by Supreme Court in Puttaswamy judgement will help us move towards an economy with robust data localisation policies.

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19. Money Laundering as a socio economic offence is a menace especially for developing countries like India. Comment. What measures have been taken at the domestic and international levels to deal with this menace?

(250 words) 15

एक सामाजिक आर्थिक अपराध के रूप में धन शोधन विशेषकर भारत जैसे विकासशील देशों के लिए एक खतरा है। टिप्पणी कीजिए। इस खतरे से निपटने हेतु घरेलू और अंतरराष्ट्रीय स्तर पर क्या उपाय किए गए हैं?

Money laundering is an illegal act of converting illicit, black money into legitimate forms by using steps like : Placement → Layering → Integration

Money laundering : socio economic menace for developing countries

↳ It leads to increased corruption, increases income inequality in society

↳ reduces the fair competition among businesses, thus dismantles economy by lowered private investment.

↳ Gives rise to organised crime & terrorism which further deter law & order and cause chaos & anarchy.

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↳ with black money in economy, and formation of shell companies, round trippings, government revenue decreases.

↳ leads to further tax evasion and reduces capacity of state to provide welfare measures, increasing further disparity.

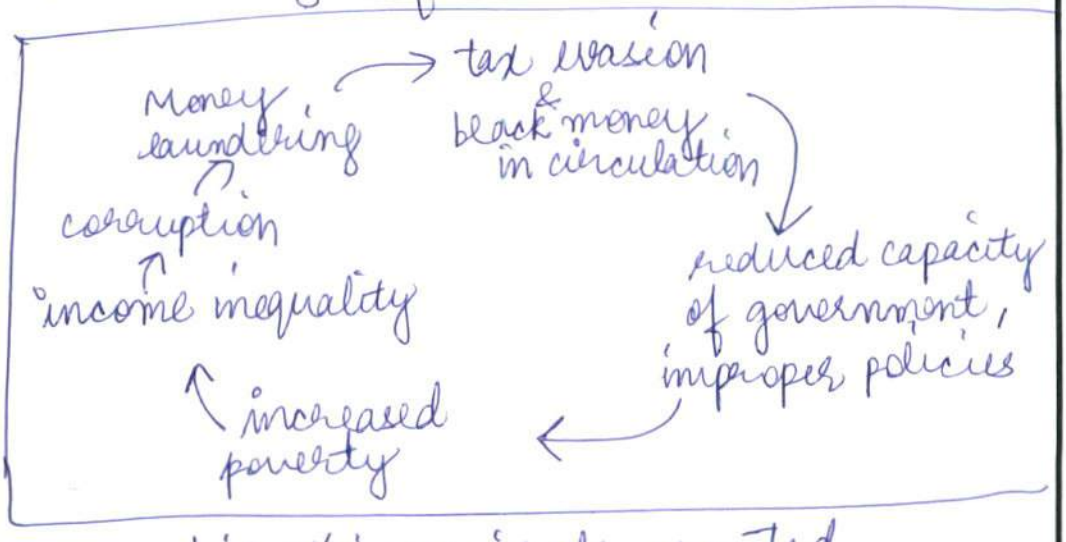

fig: Vicious circle created by Money laundering.

Measures taken:

↳ Domestic

- Prevention of Money Laundering Act
- Benami Properties Act, 1988

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· Foreign Exchange Management Act.

Institutional Methods:

- Enforcement Directorate
- Financial Intelligence Unit – India

International

- Fast Action Task Force for money laundering and ~~Fan~~ Terrorist financing
- Asia Pacific group: increasing commitment over stopping money laundering
- UN global Initiative Against Money laundering
- ~~Un~~ UN convention against Corruption
- UN convention Against Transnational organised crime.

Increasing use of cryptocurrency, digital technology is proving it to be more difficult to capture laundering. Thus collaborative action is the key.

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20. The primary motive of terrorism differs from that of organised crime but there exists a symbiotic relationship between the two. Discuss.
(250 words) 15

आतंकवाद का प्राथमिक उद्देश्य संगठित अपराध के उद्देश्य से भिन्न होता है, किन्तु दोनों के मध्य एक सहजीवी संबंध पाया जाता है। चर्चा कीजिए।

Terrorism and organised crime may seem different when looked at superficially.

Differences in primary motives & actions

Organised crimes	Terrorism
↳ Motive is to run a parallel economy, with aim of economic gain	↳ Motive is political, to create fear in the victim government & uproot it.
↳ works mainly through underground activities	↳ works in visible arena to create fear & disturbance

But, despite differences in motives, both work in synergy and have develped a strong symbiotic relationship.

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⇒ Relationship has developed because of inherent requirements & dependency.

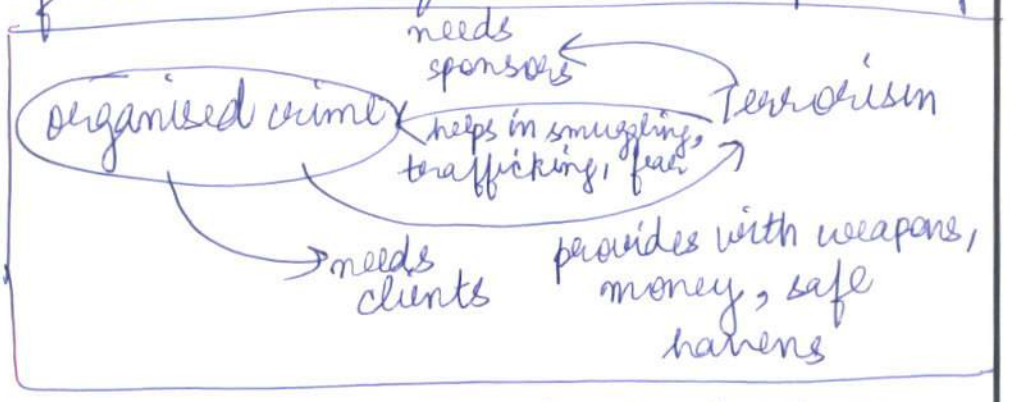

fig: synergy between the two.

⇒ With decreased state funding, terrorism has to depend on organised crime, and some terrorist organisations have developed 'in house' capabilities, eg Al Qaeda, Taliban.

⇒ Both aim to weaken the government, so that both can prosper & spread.

Thus, terrorism and organised crime go hand in hand spreading lawlessness, chaos and disorder, making them their fertile grounds of

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GENERAL STUDIES (TEST CODE : 1400)

Name of Candidate	GUNJAN SINGH		
Medium Eng./Hindi	ENGLISH	Registration Number	125597
Center	KANPUR	Date	8/5/2020

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	10	
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10	10	
11	15	
12	15	
13	15	
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15	15	
16	15	
17	15	
18	15	
19	15	
20	15	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
   उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न–पत्र कोड, विद्यार्थी क्रमांक आदि)।
2. There are **TWENTY** questions printed in **ENGLISH & HINDI**
   इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
3. **All questions are compulsory.**
   सभी प्रश्न अनिवार्य हैं।
4. The number of marks carried by a question/part is indicated against it.
   प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other that the authorized one.
   प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न–सह–उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
6. Word limit in questions, if specified, should be adhered to.
   प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
   उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।

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EVALUATION INDICATORS

1. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

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5.

6.

All the B

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1. Discuss the changes that have taken place in the role of the state and in particular the bureaucracy, in the post-liberalization era in India. (150 words) 10

भारत में उदारीकरण पश्चात् युग में राज्य और विशेषकर नौकरशाही की भूमिका में आए परिवर्तनों की विवेचना कीजिए।

In the post-liberlisation era of India, several changes have occured.

Changes
- changing notions of development
- Globalisation
- climate change
- new economic policy
- privatisation

With these changes, there has been a continuous change in the role of state & bureaucracy of India.

Change in the role of state:

Post independence, the state had adopted inward looking policy, thus played role in both sectors:

- core sectors → health, education, water, sanitation etc
- non core sectors → manufacturing watches, soaps etc.

Now Post liberalisation, state is actively involved in development activities, acting as a facilitator & regulator for private sector.

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Change in the role of bureaucracy:

⇒ with shifting priorities in governance, i.e.:

charity based approach
⇓
needs based approach
⇓
rights based approach

⇒ bureaucracy changed from REGULATOR and COLLECTOR of Revenue
⇓
FULFILLING the RIGHTS & DEMANDS of people.

⇒ with advent of RTI Act, 2005, Lokpal Act, 2013 etc, bureaucracy is shifting its role from working in secrecy, to being more transparent & accountable.

⇒ Today citizens are active participants and not mere beneficiaries, thus bureaucracy is actively involved in development process.

⇒ Technology, e-governance and civil society organisations have further made bureaucracy more flexible & accountable.

Thus, the 'steel frame' of India is continuously evolving with changing needs.

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2. There have been concerns related to foreign funding to NGOs in India. In this context, examine the current framework regulating the same. (150 words) 10

भारत में NGOs की विदेशी फंडिंग को लेकर चिंताएँ रही हैं। इस संदर्भ में, इसे विनियमित करने वाले वर्तमान ढांचे का परीक्षण कीजिए।

NGOs are often termed as 4th pillar of our democracy and have widespread positive impacts in our development process.

With globalisation and Post-1991 era, foreign funding to NGOs has increased. A report in 2014-15 revealed that about 3068 NGOs received more than 22000 crore foreign funding.

There have certain concerns related with this:

⇒ IB report mentioned a loss of 2-3% GDP due to disrupting mechanism adopted by these NGOs. Mostly these NGOs function according to foreign bodies' ideologies.

eg Kudankulam project protest by NGOs was foreign funded.

⇒ Propaganda leading to communal tensions. eg NGOs involved in spreading terms like 'intolerance'.

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⇒ These NGOs spend the funding in administrative setup of their organisation

⇒ Their research is poorly done, and mostly use foreign reports, thus minimal utilisation of foreign funding.

⇒ Not filing annual returns, thus huge opacity.

Current framework in Regulating them:

Ruled by 2 main laws:

- → Foreign Contribution Regulation Act
  - → NGOs need to renew their license every 5 yrs
  - → not more than 50% fund to be used in administrative setup.
- → Foreign Exchange Management Act.
- → NGOs with funding more than 10 lakh are under purview of LOKPAL.
- → Currently, Home Affairs ministry cancelled ~~[illegible]~~ registration of NGOs who failed to file returns for more than 5 yrs.

But this needs to be done in a streamlined manner. Need of independent regulator, Vijay Kumar Committee recommendations be followed.

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3. Setting up of Open Government Data (OGD) Platform can potentially be a game-changer for transparency and accountability. Analyse. Also, identify the challenges that remain in translating this potential into reality.

(150 words) 10

ओपन गवर्नमेंट डेटा (OGD) प्लेटफ़ॉर्म की स्थापना संभवतः पारदर्शिता और जवाबदेही के लिए गेम-चेंजर हो सकती है। विश्लेषण कीजिए। साथ ही, इस संभाव्यता को वास्तविकता में परिणत करने के समक्ष विद्यमान चुनौतियों की पहचान कीजिए।

Open Government Data Platform is a platform where government releases all its data and statistics related to economy, health, infrastructure etc.

How can this bring Transparency and Accountability?

⇒ with all data in public domain, section 4 of RTI that deals with proactive disclosure of information will be fulfilled.

⇒ government will become more answerable for its policies based on the outcomes in form of statistics.

⇒ This exercise will build trust in citizens and government will focus more towards welfare.

⇒ with technology adoption, government will improve its record-keeping, and enhance participative democracy.

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With this silent revolution, there are many challenges to bear full fruits.

Challenges:

⇒ Data protection on the lines of European ~~GDP~~ General Data Protection Rights needs to be implemented.

⇒ Infrastructure in terms of ~~tel~~ electricity needs to be reached to the remotest locations.

Saubhagya is a welcome step in this.

⇒ Internet provision and digital literacy is also required.

Bharatnet, optical fibre cable network projects, Pradhan Mantri Gramin Digital Sakshasta Mission are also a fruitful step.

⇒ The data should be comprehensive, with inter-related statistics be inter linked & clustered.

Artificial intelligence initiatives, Big Data Management Policy and multiple languages portal have the potential to make the project a reality

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4. Highlight the issues facing arbitration as an effective alternative dispute resolution mechanism in India. How does Arbitration and Conciliation (Amendment) Act, 2019 strengthen the arbitration set up in India?

(150 words) 10

भारत में एक प्रभावी वैकल्पिक विवाद समाधान तंत्र के रूप में माध्यस्थम (आर्बिट्रेशन) के समक्ष आने वाली समस्याओं को रेखांकित कीजिए। माध्यस्थम और सुलह (संशोधन) अधिनियम, 2019 भारत में माध्यस्थम व्यवस्था को कैसे सुदृढ़ बनाता है?

Arbitration is one of the forms of alternative dispute redressal mechanism.

Arbitration is a method of settling disputes between 2 parties by a third party, which is neutral and not a court.

Arbitration in India has faced some issues:

⇒ lack of experts and panels of arbitration.

⇒ Aloof from international best practices.

⇒ Parties themselves chose arbitrator, thus sometimes neutrality is compromised.

⇒ lack of a dedicated body to frame policies regarding arbitration.

⇒ International arbitration cases did not come much to India.

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Role of New Act:

Arbitration & Conciliation (amendment) Act, 2019 replaced the older act of 1996. It aims to strengthen through following ways:

- Arbitration council of India
  - frame policies for arbitration
  - promote ADR
  - create a depository of arbitrations
  - incorporate international best practices

- Focus on improving both domestic and international arbitrations.
- Supreme court will appoint arbitrators to incorporate neutrality.
- Time limit of 6 months for written submission of case.

New Delhi International Arbitration centre Act, 2019 will further supplement the Arbitration Act & make a favourable destination for international arbitrations with strong robust domestic arbitrations also.

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5. It is argued that the introduction of compulsory voting in India would strengthen its democratic credentials. Critically analyze. (150 words) 10

यह तर्क दिया जाता है कि भारत में अनिवार्य मतदान की शुरुआत से इसकी लोकतांत्रिक साख सुदृढ़ होगी। समालोचनात्मक विश्लेषण कीजिए।

Swaran Singh committee had recommended the right to vote be added in fundamental duties. Since then, compulsary voting is a debatable topic in our democracy.

Reasons why compulsary voting would strengthen democracy?

→ This would further enhance our participative democracy.

People would be more aware of their rights.

→ The current vote→seat translation, would improve,
eg 20% votes lead to zero seats in legislature, 28% votes led to victory of a party.

→ Improve the legitimacy of government, and government would function in a more accountable manner.

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Argument against compulsary voting:

→ Art 326 accords right to vote, thus making it a compulsary duty goes against the ethos of Article 326.

→ Poor voting is also because of lack of faith in government and political parties.

Thus compulsary voting are not a fool proof solution for bringing credentials in our democracy.

Real solution lies in transparent and accountable functioning of government and bridging the trust gaps. Compulsary voting has often led to mindless selection of first candidate in EVMs, thus it might not be a sustainable solution.

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6. How far do you agree with the view that administration in India requires specialists instead of generalists?

(150 words) 10

आप इस दृष्टिकोण से कितने सहमत हैं कि भारत में प्रशासन के लिए सामान्यज्ञों के बजाय विशेषज्ञों की आवश्यकता है?

Administration in India is continuously evolving according to the changing demands of our society, economy and polity. Presently, administration is carried out by generalists — All India services (Art 312), state civil services etc.

Does administration requires specialists?

⇒ Governance is becoming complex, inter-related and need of various domain specific roles.

⇒ Globalisation, economic reforms have brought in new challenges in governance, thus needed to be solved by specialists.

⇒ Specialists like RBI Governor, prove that how efficient the functioning happens.

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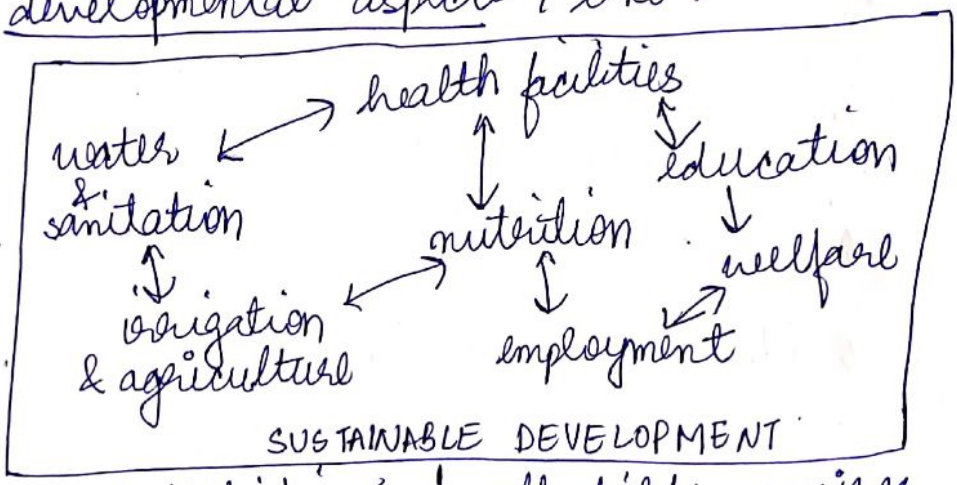
Generalists are also equally important:

⇒ Specialists may act in silos due to expertise in a single field.

⇒ Today administration focuses on developmental aspects, like:



Interlinking of all fields requires the administration to have experience and knowledge in all of these.

Thus, administration at present requires amalgamation of both generalists and specialists. The current initiative of lateral entry to the post of joint secretary is a welcome step.

Concerns regarding transparent recruitment and co-operative functioning be given utmost importance.

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7. The idea of Civil Services Board has been widely hailed as a key civil services reform, however it is not without its own limitation. Comment. (150 words) 10

एक महत्वपूर्ण सिविल सेवा सुधार के रूप में सिविल सेवा बोर्ड के विचार का व्यापक रूप से समर्थन किया गया है, हालांकि इसकी भी अपनी सीमाएँ हैं। टिप्पणी कीजिए।

civil services, termed as 'steel frame' of India have been suffering through challenges like:

- → political interference
- → arbitrary transfers & promotion
- → nepotism & favouritism
- → suspensions because of clash between union and states.

Thus in this regard, civil services board idea was mooted, which would handle transfers, promotions of the civil servants, based on objective and unbiased criteria.

But, there are some inherent limitations with it.

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→ The board lacks power in taking any punitive action against civil servants due to ~~Act~~ 311.

→ Constitution and composition of Board is done by government, thus bringing in political interference.

→ There may be chances of some opacity in functioning of board, thus defeating the purpose of ~~the~~ its formation.

Nevertheless, Civil Services Board will bring in uniformity, transparency in the much required field of civil services in India.

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8. The office of the Lokayukta has been in place in many states for a long time. Discuss the issues faced by this office in exercising its functions effectively. (150 words) 10

लंबे समय से कई राज्यों में लोकायुक्त का पद विद्यमान रहा है। अपने कार्यों के प्रभावी संचालन में इस पद के द्वारा सामना किए जाने वाले प्रमुख मुद्दों पर चर्चा कीजिए।

The Lokpal and Lokayuktas Act, 2013 institutionalised the office of Lokpal & Lokayukt in India. but Lokayukta office has been present much before that. Maharashtra instituted the office in 1971 and by 2013, 21 states & Delhi had the post of Lokayukta.

Lokayukt is ~~an~~ an anti-corruption and vigilance office, but its functioning has several issues in various states.

Issues:

→ Not all states have chief ministers under the jurisdiction of Lokayukt. (like Maharashtra, Bihar etc).

→ Qualifications not mentioned by all states.

→ The investigation powers also varies as Lokayukts are not assisted

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with suitable investigative machinery

→ Many states have just created the office without appointing a person to the office.

→ Appointment and selection criteria is not well codified in all states

→ The power to investigate allegations and redressing grievances not given uniformally in all states.

With position of Lokpal facing severe challenges, it becomes highly imperative that both the centre and states take timely action to strengthen the offices of Lokpal & Lokayuktas.

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9. What are the issues ailing Citizen's Charters as an effective tool for holding public servants accountable? How can these issues be addressed? (150 words) 10

लोक सेवकों को जवाबदेह बनाने के एक प्रभावी साधन के रूप में नागरिक चार्टर को पंगु बनाने वाले मुद्दे कौन-से हैं? इन मुद्दों का समाधान कैसे किया जा सकता है?

citizen's charter is a standard of service which was introduced in India in 1997. The charter is a paradigm shift towards making governance →
- Transparent
- Accountable
- Responsive
- dynamic.

But the charter could not emerge as an effective tool for holding public servants accountable because of following reasons:

① The charters of various departments are like brochures, & vaguely worded.
eg Income tax department charter.

② Lack of internal restructuring, thus no clear defined role for a specific office.

③ Lack of measurable targets, indices in the charter, made it confusing for the citizens to follow.

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(4) Charter formulation is not binding, and neither is the grievance redressal mechanism in it.

(5) Various departments have not notified the names and positions of the responsible offices, thus leading to opacity in charters.

How to address the Issue?

(1) 2nd ARC ~~to~~ recommended to appoint Public Grievance Officer like PIOs in every department

(2) Charters should be widely publicised and features of Sevottam Model be adopted.

(3) Add measurable standards, with clear monitoring and feedback evaluation methods.

(4) Technology adoption and internal restructuring should happen simultaneously.

Citizen Charter has the potential of transforming our governance, thus it should be made robust & practical.

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10. Identify the key focus areas on which Digital India Mission is centered upon. Also, throw light on the approach and methodology of the program. (150 words) 10

उन प्रमुख फोकस क्षेत्रों की पहचान कीजिए जिन पर डिजिटल इंडिया मिशन केंद्रित है। साथ ही, इस कार्यक्रम के दृष्टिकोण और कार्यपद्धति पर भी प्रकाश डालिए।

Digital India Mission is a flagship program of a 'New India'. It is a silent revolution which will transform the development process of our country.

Key Focus Areas of Mission

- improve digital infrastructure
- improve e-governance mechanism for delivery of goods and services
- digital literacy and empower the citizens for participative democracy.

The program is an umbrella mission, which has features of introducing digital medium in all fields, like: ① Government – Government
② Government – Business
③ Government – Citizen

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Approach of the program:

⇒ To bring in transparency and accountability in functioning.

⇒ To involve citizens in feedback mechanism through PRAGATI app, e-Samiksha etc mygov.in, UMANG app etc.

⇒ To reach all the citizens, following minimum government, maximum governance.

Methodology of the Mission:

⇒ Bharat Net, Optical fibre Network to connect with gram Panchayats (1.56lkh)

⇒ Including satellite technology, geo-tagging in programs & policies. eg: PMfasal Beema Yojana, MGNREGA etc.

⇒ Educating people through PM Gramen Digital Saksharta Mission.

⇒ Digi locker, Bhim App, Meghdoot & Artificial Intelligence to venture into new fields.

Thus, with data protection policy digital India mission will become a holistic program of India.

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11. Explain how the linkage between banks, NGOs and SHGs helps in facilitating access to microfinance and contributes to the development of rural areas. (250 words) 15

स्पष्ट कीजिए कि बैंकों, NGOs और SHGs के मध्य संपर्क किस प्रकार सूक्ष्म वित्त तक पहुँच को सुविधाजनक बनाने में सहायता करता है तथा ग्रामीण क्षेत्रों के विकास में योगदान देता है।

Microfinance means providing credit and financing facilities to the weaker, marginalised and rural areas of India. To facilitate this, banks, NGOs and SHGs together play an important role in facilitating the development of rural areas.

How SHGs and banks are working in tandem:

⇒ SHGs are a voluntary group in a village, which take up entrepreneurial activities for their development.

⇒ SHG-bank linkage program in 1992 is a landmark feature in micro-financing. Stand-up India & MUDRA has further helped them.

⇒ Rural co-operative banks, Rural development banks take aid from

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NABARD to further supplement the savings of SHGs.

eg Anand dairy SHG, Lijjat Papad, Kudumbshree (Kerala), Sahavikasa (Andhra Pradesh) all have facilitated microfinance and developed rural areas.

How SHGs and NGOs facilitate microfinance and develop rural areas?

⇒ Various NGOs like GOONJ, Upay etc help SHGs develop as microfinance institutions which further boosts the entrepreneurial activities.

eg NGOs in Uttarakhand are helping women earn through packaging pulses and then provide credit to others, thus acting as microfinance institutions.

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Forbes has mentioned 7 Indian Microfinance Institutions in its top 50 MFIs. eg Bandhan Bank. Also, World Bank report came up with data that MFIs have reached to more than 500 million people.

All this has developed rural areas in fields of
- → livelihood opportunities
- → micro enterprises
- → women empowerment
- → social capital.

eg AGEY scheme of running e-rickshaw works through SHGs which provides employment to many.

With financial inclusion, financial literacy, penetration of banking services and proper implementation of Priority Sector lending, rural areas development will be along the sustainable development goals.

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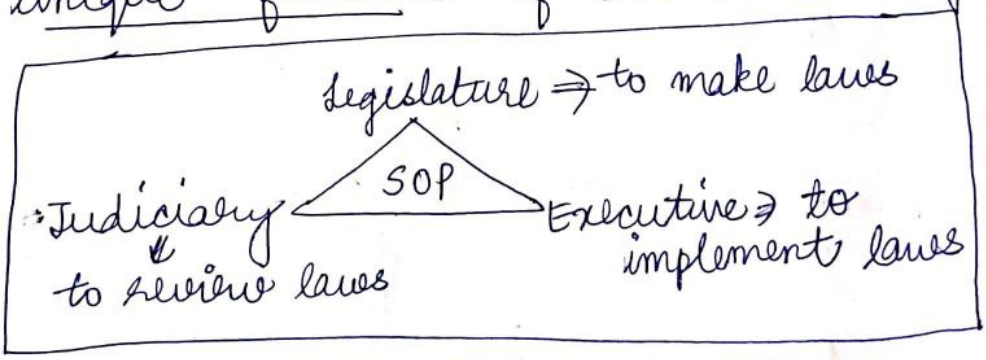
12. There is no strict separation of powers under the Indian Constitution, with the executive, legislature and judiciary empowered to carry out functions which may be considered within the purview of the other. Discuss. (250 words) 15

भारतीय संविधान के अंतर्गत शक्तियों का कोई कठोर पृथक्करण मौजूद नहीं है, जिसमें कार्यपालिका, विधायिका और न्यायपालिका को उन कार्यों को संपादित करने हेतु सशक्त किया गया है जिन्हें दूसरे के क्षेत्राधिकार में शामिल माना जा सकता है। चर्चा कीजिए।

The doctrine of separation of Powers (SOP) was introduced by French thinker Montesquieu. This feature has become a part of basic structure of our constitution.

SOP between the 3 organs of our polity is not strictly watertight, thus making it a unique feature of our democracy.



How one organ carries out functions of other organs?

→ (1) Executive and Legislature

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⇒ Art 79 talks about Parliament, and Art 74 talks of Executive, but both carry out mixed functions :

eg Legislature
⇓
- leaves out rules & regulations for Executive to frame by delegated legislation

Executive
⇓
- President promulgating ordinances (Art 123)

② Legislature vs Judiciary

Though both have separate ways of functioning, and check each others powers by effective checks & balances, sometimes they do mixed functions.

eg Legislature
⇓
- Impeachment of President & higher judiciary
- Punishing anyone for contempt of Legislature

Judiciary
⇓
- Using powers of Art 142, making schemes like ⇒ Whistleblowers Protection Scheme.
- Coming up with guidelines ⇒ like Vishaka, Police Reforms as rules & regulations for all to follow.

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③ Judiciary and Executive

Judiciary functions through evidences and executive through "guided discretion" given by legislature, yet overlapping features like:

Judiciary

- deciding the administrative setup, salaries etc of Supreme Court & High Court.
- Appointing through the dominance of collegium.

Executive

- President giving mercy petitions (Art 72)
- Executive in Tribunals (Art 323A, 323B).
- ~~Do~~ District Magistrate working as Returning officer during elections is a quasi judicial function.

Thus, constitution has relaxed the separation of powers so that co-operation & inter-linking between organs remain, without encroaching on each others rights.

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13. Critically examine whether the Model Code of Conduct (MCC) should be made legally enforceable. (250 words) 15

समालोचनात्मक परीक्षण कीजिए कि क्या आदर्श आचार संहिता (MCC) को विधिक रूप से प्रवर्तनीय बनाया जाना चाहिए।

Model Code of Conduct is a novel feature of our election system which leads to level playing field and free-and-fair elections. This is still voluntary and unenforceable.

Should MCC be made legally enforceable?

⇒ MCC came up in 1962, but became effective only after the brave efforts of T. N. Sheshan after 1991 who rebuked influential politicians & delayed elections.

This manifests that legal provisions had made MCC effective since 1962 itself.

⇒ With increasing criminalisation of politics, it has become difficult to control money & muscle power,

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thus legal enforcement will help in curbing irregularities.

eg 34% of MPs in 16th Lok Sabha had criminal records, which is higher than last election.

⇒ Encroachment of digital & social media has made various sections like sec 126 of RPA, 1951 ineffective.

Thus, the need is to control all this by legal provisions of MCC.

⇒ Corrupt practices (sec 123(3)) and misusing government power – like doling out populist schemes will get checked by making MCC enforceable.

MCC be not made enforceable:

⇒ Though MCC itself is not directly enforceable, its provisions are enforceable through IPC, 1860,

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CrPC, 1973 and RPA, 1951.

⇒ Election commission is against enforcing it, as it will lead to judicial cases which will increase and disrupt the electoral processes.

⇒ Art 324 gives wide powers of superintendence, direction & control of elections to Election commission, eg it cancelled RK Nagar elections in Tamil Nadu because of money power.

Thus, there is need to empower the Election commission further and bring other electoral reforms like state funding of elections; not chosing criminal candidates etc before making MCC enforceable. Initiatives like cVIGIL are welcome step in including the citizens in this process.

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14. What are the challenges in conducting free and fair elections in the era of proliferation of social media? In this context, identifying the steps taken by the ECI, suggest further measures. **(250 words) 15**

सोशल मीडिया के प्रसार के युग में स्वतंत्र और निष्पक्ष चुनाव के संचालन में आने वाली चुनौतियाँ क्या हैं? इस संदर्भ में, ECI द्वारा उठाए गए कदमों की पहचान करते हुए आगे के उपायों को सुझाइए।

Free and fair elections are sin qua non of our democracy. With increasing role of social media, election process has become more complex and tedious.

Challenges posed by social media

⇒ The ban of use of media for exit and opinion polls do not apply to social media under Sec 126 of Representation of People's Act, 1951.

⇒ Social media is used as a platform to flout the model code of conduct, which is not legally enforceable

⇒ Social media has far reaching impacts and often lead to communal

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violence during elections, due to widespread use of fake news.

⇒ Social media has created a kind of digital divide, where on one hand there are over zealous citizens, and on other hand citizens having no knowledge of its existence, thus not a reliable medium for uniform spread of authentic news by state machinery.

Measures taken up by ECI

⇒ ECI has set up Media certification and monitoring committee (MCMC) at district and state level to check paid news including on social media.

⇒ ECI has directed the social media bodies like facebook, whatsapp etc to come up with self-regulation practices. In this context IMAI has come up with such guidelines,

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⇒ ECI used CVIGIL app, and started various awareness programs to educate people regarding misuse of social media.

⇒ Umesh Sinha committee has recommended to include print media & social media in sec 126 of Representation of People's Act, 1951.

Additional steps to be taken:

⇒ Press Council of India be made more powerful and social media be added under its ambit.

⇒ Big Data and Artificial Intelligence should be utilised to check the malpractices through social media.

⇒ Election commission be made more strong, by giving equal protection to other ECs.

Elections, if free & fair, will make our democracy strong, thus they need to be made robust & all challenges be eliminated.

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15. Social audit can ensure a citizen-centric mode of accountability but there exist many issues in its implementation. Analyse. (250 words) 15

सामाजिक अंकेक्षण जवाबदेही की नागरिक-केंद्रित पद्धति को सुनिश्चित कर सकता है, लेकिन इसके कार्यान्वयन में कई समस्याएँ विद्यमान हैं। विश्लेषण कीजिए।

Social audit is one of the mechanisms of checking accountability of various authorities, their social and ~~econo~~ economic impact on society.

Significance of social audit as a citizen centric medium for accountability;

⇒ By involving people from grassroot level, it ensures that government policies have reached them.

⇒ It is one of the most significant weapon to check actual performance of policies.

⇒ 73rd amendment act, 1992 made Gram Sabha as a unit of social audit, since then transparency has crept in governance.

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Although, social audit is a great tool for accountability, its implementation is still bleak.

Reasons for issues in implementation:

⇒ Social audit is not legally enforceable, thus it depends on the awareness level of people, which is quite low.

⇒ Social audit records are not well kept, and there are lack of experts at grassroot level.

⇒ Though it is an exercise from the start of a program, it is mostly used as a post-mortem exercise.

⇒ Gram Sabha unaware of its constitutional powers.

⇒ Social audits are highly localised & not publicised, thus accountability suffers.

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social audit has the potential to make participative democracy successful and help the governance in being effective. For this it is necessary, that both citizen centric approach and accountability be ensured.

Way forward

- experts at local level
- make people aware of their rights
- CAG has recommended auditor general of states to institutionalise social audit
- proper documentation and publication of audit details

Thus, then only citizen-centric mode of accountability will succeed in India.

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16. With adequate policy incentives and civil society participation, entrepreneurship has the potential to become a vehicle for socio-economic mobility in India. Explain. (250 words) 15

पर्याप्त नीतिगत प्रोत्साहन और नागरिक समाज की भागीदारी के साथ, उद्यमिता में भारत में सामाजिक-आर्थिक गतिशीलता का वाहन बनने की क्षमता है। स्पष्ट कीजिए।

Socio-economic mobility in India has been a prerogative of the state since a long time. With schemes like 'Garibi Hatao', 'Food for Work' programmes, state tried to ~~pasha~~ pull people out of poverty.

Entrepreneurship has become a potent tool in helping people in current times.

How?

- helping others by ~~xxx~~ generating more employment
- people becoming self-reliant
- making use of market features & benefitting from them.
- multiplier effect and creating further demand

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Entrepreneurship has to be supported by both :

policy incentives

1. Ease of Doing Business
2. Start-up India
3. Stand-up India
4. MUDRA scheme
5. SHGs linkage program
6. Priority sector lending
7. Skill India Mission

civil society participation;

1. helping the SHGs grow by providing resources
2. inculcate the risk-taking behavior among people
3. help in providing health, nutrition & education & other activities to all

Entrepreneurship is a panacea for not single employment, but creating capabilities & building capacities for generating more job opportunities.

eg Lijjat Papad today is

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providing employment opportunities to many.

Mahila Kisan Sashaktikaran Pariyojana, Priyadarshi schemes have empowered women SHGs which have ventured in various roles.

Thus from multi-million dollar start-ups to small micro enterprises, socio-economic development is possible when conducive environment is present

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17. Identify the different issues associated with the design and implementation of MGNREGA. What reforms have been taken in recent times to address the above identified issues? (250 words) 15

मनरेगा (MGNREGA) की अभिकल्पना और कार्यान्वयन से जुड़े विभिन्न मुद्दों की पहचान कीजिए। उपर्युक्त चिन्हित समस्याओं का समाधान करने के लिए हाल के दिनों में क्या सुधार किए गए हैं?

MGNREGA is an employment guarantee act of 2005, that promised 100 days of manual labour to each willing household in a financial year.

The scheme is one of the most promising device to pull people out of poverty. eg it provided employment giving 235 crore person days of work in 2014-15.

Yet, its design & implementation have some issues which are stopping it from becoming truly fruitful.

Issues in design of MGNREGA:

→ It just talks of manual labour, no focus on

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skilling.

→ The ratio 60:40 expenditure division is also debatable.
60% expenditure → labour
40% expenditure → material.

→ No accountability mechanism, social audit concept vaguely explained.

Issues in Implementation:

→ Record keeping is poor and irregular.

→ Wide scale corruption, as it led to just digging holes in name of ponds.

→ Minimum wages debate pertains as sometimes paid less than that.

→ Delay in disbursal of payments.

→ Compensatory payment after 15 days notification is often flouted.

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Reforms taken:

Government has time and again come up with various like:

→ GIS tagging of assets created
→ institutionalising social audit
→ adding skills in the agenda, once 100 days manual labour is done
→ setting up uniform minimum wages criteria across country.
→ Rural Development ministry will earmark some budget for training.
→ Focus on creating irrigation structures.

Thus, with these measures, MGNREGA can transform the rural development process, but alarming features like more youth in MGNREGA should be checked, by helping provide gainful employment.

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18. What is the rationale behind having a None of the Above (NOTA) option in elections? Do you think rather than NOTA the idea of right to recall would better serve the purpose of deepening democratisation in India? (250 words) 15

चुनावों में 'उपर्युक्त में से कोई नहीं' (NOTA) विकल्प रखने के पीछे क्या औचित्य है? क्या आप मानते हैं कि NOTA के बजाय राइट टू रिकॉल (वापस बुलाने का अधिकार) का विचार भारत में लोकतंत्रीकरण को मजबूत बनाने के उद्देश्य को बेहतर तरीके से साकार करेगा?

None of the Above (NOTA) option is an electoral reform introduced by PUCL vs Union of India case by Supreme Court in 2013.

Rationale behind NOTA:

↳ with increasing malpractices and criminalisation of politics, it is necessary to give voice to disenchanted citizens.

↳ It is a fundamental right under Art 19(1a) as freedom of speech and expression.

↳ It is an option of active participatory democracy where dissent is expressed over other candidates.

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NOTA is not right to reject, that is, even after maximum ~~no~~ NOTA votes, elections are not cancelled.

NOTA vs Right to Recall:

↳ NOTA just expresses rejection of other candidates with no outcome.

Right to recall is a method of dismissing a chosen & elected candidate from his office.

↳ Right to recall is a method of direct democracy, while NOTA ensures participative indirect democracy.

Right to Recall benefits in further democratisation:

- make freedom of speech more effective
- will bring inner party democracy
- will empower & aware citizens.

But this has certain challenges like ⇒ financial problems
⇒ over application of MCC
⇒ administrative challenges etc.

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Thus, replacing NOTA with right to recall would not be a prudent step. Some measures like:

↳ Right to recall for grave offences can be introduced.

↳ Maharashtra, Haryana state ECs have disqualified elections if NOTA is winner, and disqualified candidates getting lesser votes than NOTA, respectively.

Thus these progressive steps can be adopted.

For deepening democracy, we need more aware citizens and amalgamation of both NOTA and right to recall.

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19. A sound legal framework, robust institutional mechanism for establishing rule of law, competent and dedicated workforce and decentralization and delegation are some of the necessary preconditions for good governance. Elaborate. **(250 words) 15**

एक सुदृढ़ विधिक ढांचा, विधि के शासन को स्थापित करने के लिए मजबूत संस्थागत तंत्र, सक्षम और समर्पित कार्यबल तथा विकेंद्रीकरण एवं प्रत्यायोजन सुशासन हेतु कुछ आवश्यक पूर्वापेक्षाएं हैं। सविस्तार वर्णन कीजिए।

Good governance is a form of governance where all the state and non state actors (NGOs, market) work in tandem to improve service & goods delivery and make the citizens empowered.

Pre-conditions for good governance:

① Sound Legal Framework and Robust institutional mechanism for establishing Rule of Law:

↳ Bringing transparency through Right to Information Act, 2005.

↳ Starting accountability through e-governance like PRAGATI apps, social audit mechanism.

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↳ Implementing DPSP through acts like → free & legal aid by NALSA Act, 1987, livelihood to all by MGNREGA act, 2005 etc.

↳ setting up citizen charter.

↳ Forming vigilance bodies like Lokpal, CVC, CBI to check corruption

② Competent & Dedicated workforce

↳ Role of bureaucracy has shifted towards developmental activities.

↳ Implementing welfare policies.

↳ Incorporating technology.

7 principles of public service

← leadership
← openness
← accountability
→ selflessness
→ honesty
→ integrity
↓ objectivity

↳ 360° evaluation mechanism be present in all levels.

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③ decentralisation & delegation

↳ bottom-up approach ensures that public needs are well accounted for in policy making

↳ multi-level planning ensures participation of all stakeholders, thus providing legitimacy in governance process.

↳ delegation helps in demarcating specific roles & setting up accountability for all.

Thus 73rd amendment act, 1992; delegated legislation, environment impact assessment (EIA), rationalisation of CSS are some steps towards good governance.

Hence, all these features ensures sustainable development & good governance of a polity.

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20. Highlight the need of citizen engagement in e-governance projects in India. In this context, mention the framework adopted by NeGP for citizen engagement. (250 words) 15

भारत में ई-गवर्नेंस परियोजनाओं में नागरिक सहभागिता की आवश्यकता पर प्रकाश डालिए। इस संदर्भ में, नागरिक सहभागिता के लिए NeGP द्वारा अपनाए गए ढांचे का उल्लेख कीजिए।

E-governance projects are those initiatives of government where information & communication technology (ICT) are used to deliver goods & services to citizens.

Need for citizen engagement in e-governance projects in India:

↳ with citizen engagement, there comes effective feedback of the government policies.

↳ citizen engagement make the outcome of policies more clear, moving towards participative democracy.

↳ It gives an option to the government to assess the status of its policies, & improve from evaluations.

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↳ static e-governance projects with no citizen partnership involves become similar to traditional methods where:

- corruption breeds
- red tapism
- top-bottom approach rules'

For, citizen involvement, the e-governance projects now are oriented with certain features. In this context, NeGP (National e-Governance Policy) has brought dynamic shifts.

NeGP and its latest version E-Kranti 2.0 have involved features like:

- checking accountability through PRAGATI, E-Samiksha,
- making all functions, records in digital mode and to be assessed by public, eg digitisation of PDS,
- Shillong declaration focused on making e-governance more robust with more Government - Citizen features,

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eg mygov.in helps the citizen to give feedback of various government initiatives.

↳ Urban and rural development also incorporating citizen involvement,
eg Smart Cities portal, ~~PARIVAARAMBH~~ app for rural road construction

↳ focusing on tele-edu, tele-health etc. eg SWAYAM, DISHA for teachers.

Thus, citizen involvement being sin qua non of e-governance must be ensured further with digital literacy and infrastructure development.

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GENERAL STUDIES (TEST CODE : 1403)

Name of Candidate	GUNJAN SINGH		
Medium Eng./Hindi	ENGLISH	Registration Number	125597
Center	KANPUR	Date	13-05-2020

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	10	
2	10	
3	10	
4	10	
5	10	
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7	10	
8	10	
9	10	
10	10	
11	15	
12	15	
13	15	
14	15	
15	15	
16	15	
17	15	
18	15	
19	15	
20	15	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
   उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न–पत्र कोड, विद्यार्थी क्रमांक आदि)।
2. There are **TWENTY** questions printed in **ENGLISH & HINDI**
   इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
3. **All questions are compulsory.**
   सभी प्रश्न अनिवार्य हैं।
4. The number of marks carried by a question/part is indicated against it.
   प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other that the authorized one.
   प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न–सह–उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
6. Word limit in questions, if specified, should be adhered to.
   प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
   उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।

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EVALUATION INDICATORS

1. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

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6.

All the Bes

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1. Explain how the theory of Plate Tectonics helps in understanding the mechanism of volcanism. (150 words) 10

व्याख्या कीजिए कि प्लेट विवर्तनिकी सिद्धांत ज्वालामुखी की क्रियाविधि को समझने में किस प्रकार सहायता करता है।

Volcanism is the process of eruption of lava or magma from the interiors of earth to the surface of earth. Mechanism and manner of volcanism is best explained by the modern Plate Tectonics theory.

Volcanism can be in 2 main ways

- around a central vent
  - ⇓ This is mostly viscous, explosive, has felsic minerals
  - ⇓ along plate boundaries
- along a fissure or crack
  - ⇓ this is mostly quiet, mafic and more fluid
  - ⇓ It is mostly along intra-plates

Plate tectonics deals with the interaction of plates ~~to~~ (lithospheric plates floating on asthenosphere). The interaction leads to events of volcanism.

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Best

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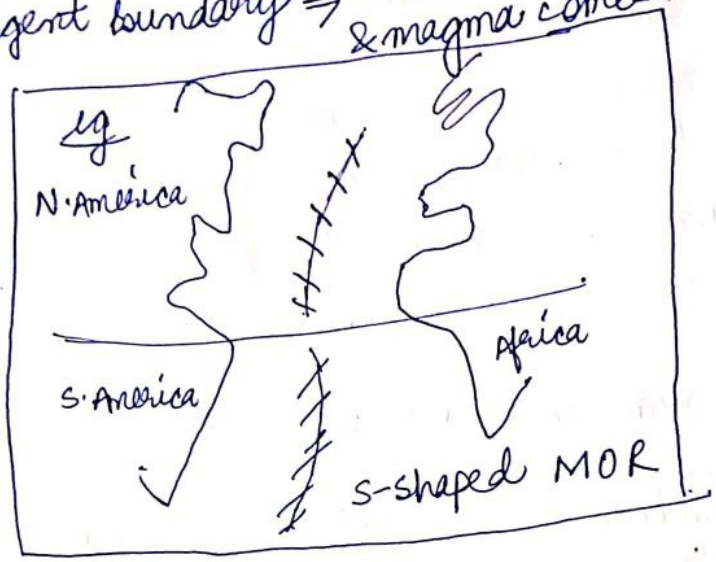
Volcanism

Plate Tectonics

1) Divergent boundary ⇒ Plates moving apart & magma comes out.



2) convergent boundary:

a) ocean – ocean plate converges ⇒ subducting plate releases magma ⇓ formation of ~~to~~ volanic archipelagoes

eg Andaman & Nicobar, Baren Island, volcanoes in Japan, Phillipines etc.

b) ocean – continent convergence ⇒ andesitic volcanoes

eg Chimbrazo, Cotopaxi volcanoes in Rockies & Andes mountains.

Pacific Ring of Fire volcanoes.

3. Hot spots ⇒ These are intra-plate volanic fissures

eg Azores Island, Hawaiian Island etc.

Thus, plate tectonics explains volcanism clearly.

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2. Discuss how technology can help India cope with disasters. (150 words) 10

चर्चा कीजिए कि प्रौद्योगिकी भारत में आपदाओं से निपटने में कैसे सहायता कर सकती है।

Disaster management and risk reduction are important proactive steps taken up by India. In this, role of technology is manifold.

Role of Technology in coping with disasters

Pre-Disaster ⇒

⇒ Capacity Building & Preparedness

- Technology helps in building resilient infrastructure like buildings, earthquake resistant Dams etc.
- Developing state-of-art early warning system using rainfall forecasting systems, GIS, Artificial Intelligence.
- Developing critical communication infrastructure.
- Vulnerability mapping using

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drones, GIS maps etc.

eg. Geological survey of India has made hazard zone mapping for landslides using GIS & big data.

Post-disaster ⇒

⇒ Relief & Rescue:

- Role of social media in helping the government, CSOs & affected people.
- Robots in extracting victims who are strangled.

⇒ Rehabilitation & Reconstruction:

- Using data analytics, helping the people with basic needs.
- Reaching out to people using communication.

But, technology can fail or can be misused. eg Nepal earthquake & role of social media. Thus judicious used, expertise, & competence of technology is a must in coping with disasters.

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3. Bring out the importance of community-based disaster management in India. (150 words) 10

भारत में समुदाय-आधारित आपदा प्रबंधन के महत्व को स्पष्ट कीजिए।

According to UN report, 82% of Indian population is vulnerable to disasters. Thus in managing the disasters & building resilience, community-based disaster management is very important.

Importance :

⇒ Including community has helped India to become more efficient in tackling disasters proactively, rather than just a reactive setup.

⇒ Disaster management being continuous process, thus information, education, communication, ~~com~~ training & capacity building will play a major role.

How disaster-management becomes robust with community participation?

⇒ Pre-Disaster : Preparedness, Risk Reduction, Mitigation ⇒

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- Communities have their own indigeneous survival mechanisms, through traditional knowledge. It can be used holistically.
- More aware of the rescue routes, thus better planning is possible.

Post - Disaster:

⇒ Rescue & Relief ⇒ Locals are the first responders, and with regular drill exercises, they can utilise the 'Golden Hour' properly.

⇒ They can help in better vulnerability assessment, thus taking care of women, children & marginalised population.

Involving community makes them aware, confident in coping up with the disaster, & builds their capacity. Thus community is integral part of disaster management.

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4. What is ice-albedo feedback and how is it related to climate change? (150 words) 10

आइस-एल्बिडो फीडबैक क्या है और यह जलवायु परिवर्तन से किस प्रकार संबंधित है?

Ice-albedo feedback means the relationship between the insolation, reflection (albedo) and snow cover in cryosphere or permafrost regions.

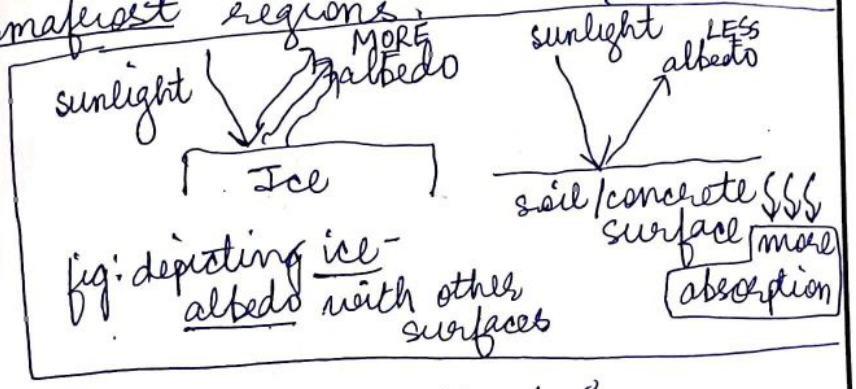
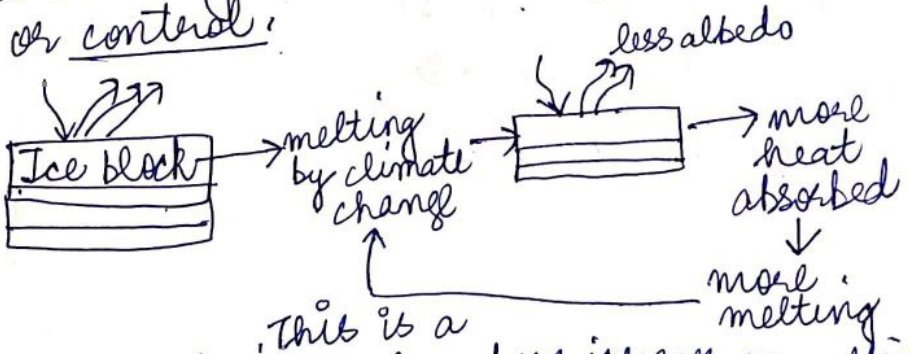


fig: depicting ice-albedo with other surfaces

Ice-albedo feedback is a positive feedback mechanism, where the results or consequences keep on increasing with lack of homeostatis or control.



This is a positive cycle where ice goes on melting

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This ice albedo mechanism is closely related with climate change,

Anthropogenic activities → global warming, high temperatures, Black Carbon released

with decreased albedo, heat insolation increases, thus more melting. ← Arctic, Himalayas ice cover in reducing

This ice-albedo feedback is affecting the river regimes, monsoonal patterns and thermohaline circulations in Atlantic ocean. Thus, with climate change, this feedback process will further accelerate.

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5. Why has there been an increase in the frequency of Glacial Lake Outburst Floods across the world? Highlight the measures, which can be taken to tackle these floods. (150 words) 10

विश्व भर में ग्लेशियल लेक आउटबर्स्ट फ्लड की आवृत्ति में वृद्धि क्यों हुई है? ऐसे बाढ़ से निपटने के लिए अपनाए जा सकने वाले उपायों को रेखांकित कीजिए।

glacial lake outburst floods are a type of floods in the regions of glacial retreat. The lakes formed within the unconsolidated moraines breaks open causing floods.

Reason for increasing frequency of GLOF:

Natural
- Glacial lakes in seismic zones.
  eg Himalayas are in Earthquake zone IV & V
- unpredictable rainfall patterns

Man-Made
- Due to climate change & ↓albedo, more ice melting
- slope alterations
- Mass tourism & pressure of populatio
- Dams diverting water
- Black carbon induced ice melting

Thus these reasons have led to increased GLOF in Alpine Himalayas and other glacial regions of the world.

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Measures to tackle these floods:

1. Better preparedness with robust early warning systems, capacity building of community by continuous drilling exercises.
2. Using technology to map vulnerability zones, eg as done in Sikkim - Darjeeling region in India.
3. Using structural measures like cementing the moraine embankments etc.
4. Sustainable tourism and long term efforts of reducing the impacts of climate change.

Thus, we need to protect biodiversity, livelihoods & hydrological systems by preventing GLOFs.

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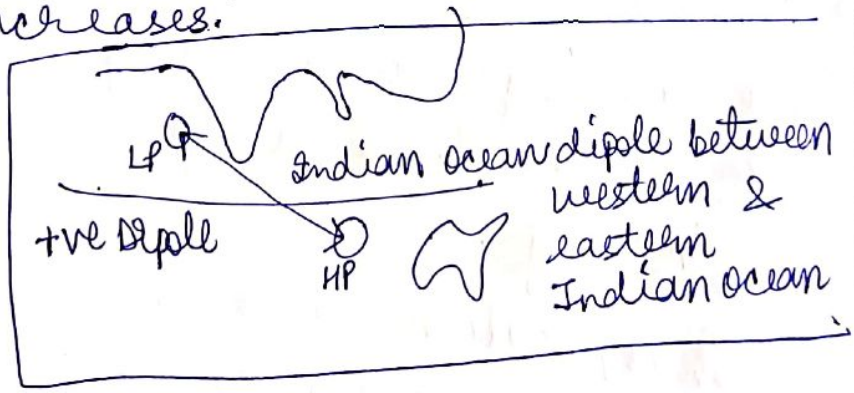
6. Give an account of the increasing frequency of cyclonic activity in the Arabian Sea region. (150 words) 10

अरब सागर क्षेत्र में चक्रवाती गतिविधि की बढ़ती आवृत्ति का विवरण प्रस्तुत कीजिए।

Arabian sea which generally ~~seas~~ sees less cyclonic activity has had suffered with 5 cyclones in 2019. This increased frequency of cyclonic activity can be attributed to various reasons:

↳ Positive Indian-ocean dipole, warms the Arabian sea, thus chances of low pressure cells increases.



↳ Due to less no. of rivers, there is decreased freshwater mixing, this has led to further

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temperature increase.

⇒ Some cyclones like Okhi have crossed Bay of Bengal, making it a cyclonic activity for Arabian sea.

⇒ Most of the cyclones like Hikaa, Kyarr and Vayu have remained parallel to coastline leading to heavy rains & winds along coasts.

⇒ Climate change related impacts are causing several low pressure depressions, of which cyclones are originating.

Thus, Arabian sea is the new hotspot of cyclones and early warning system should be made very robust to tackle the unseen danger.

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7. Explain the phenomena of Sudden Stratospheric warming witnessed in recent years. How does it affect the ozone hole formation over Antarctica? (150 words) 10

हाल के वर्षों में देखी गई आकस्मिक समतापमंडलीय तापन की परिघटना की व्याख्या कीजिए। यह अंटार्कटिका के ऊपर ओजोन छिद्र के निर्माण को किस प्रकार प्रभावित करता है?

Sudden stratospheric warming is a phenomena where the upper layers of atmosphere, i.e. from 10 km – 50 km above earth surface, temperature increases suddenly upto 50°C within a span of few days.

This phenomena happens in the polar regions where strong polar vortex forms at the North & South Pole.

Ozone hole over Antarctica has been increasing due to CFCs, HCFCs etc. These long term particles exist on the stratospheric clouds in winters, and during spring when temperature increases, the free radicals of chlorine, Bromine (Cl^-, Br^-) react with ozone

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layer and breaks it into O_2.

Sudden stratospheric warming has led to increased temperatures even in winters, thus increasing the reaction time of radicals with ozone layer. Hence increasing the ozone hole formation. The polar vortex ~~loads~~ meanders during sudden stratospheric warming, thus carrying the reaction to far off places along the pole.

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8. Explain the concept of volcanic winter giving examples. (150 words) 10
उदाहरण प्रस्तुत करते हुए वोल्कैनिक विंटर की अवधारणा की व्याख्या कीजिए।

Volcanic winter is a term associated with temperature decrease during sustained volcanic eruptions.

Volcanic eruptions lead to numerous gases, dust particles and pyroclast in atmosphere. The amount of these outputs depends on the type of eruption of volcanoes.

Thus, strong eruptions like
- → Vulcanian eruption from Mt Etna, Mt stromboli etc
- → Pelean eruption from Mt Karakatoa etc

cause huge amount of gases like SO_2 in air. These gases and dust particles act as aerosols & a layer above earth's surface.

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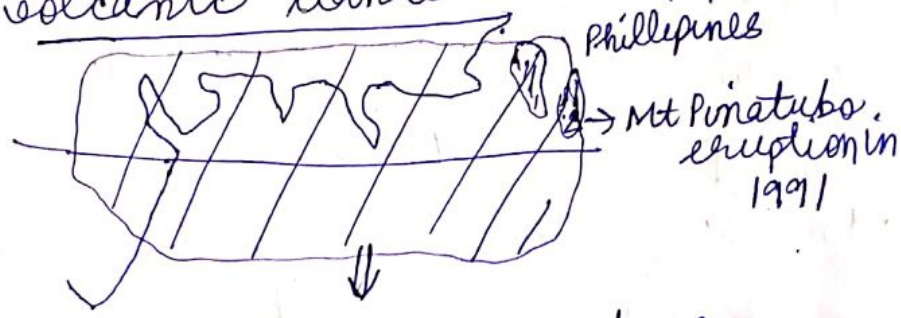
This further leads to high albedo and prevents sunlight from reaching earth.

Hence the whole phenomena leads to temperature decrease for large periods (1–3 years), leading to volcanic winters.



⇓

Aerosols & SO_2 from eruption led to volcanic winter till Eastern Africa and also influenced El-Nino circulations.

Thus such events are a part of climatic history of earth.

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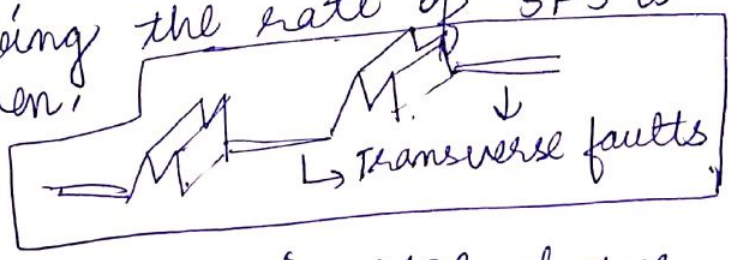
9. Bring out the prominent evidences that have been put forward in support of sea-floor spreading. (150 words) 10
सागरीय-अधस्तल विस्तार के समर्थन में प्रस्तुत किए गए प्रमुख साक्ष्यों का उल्लेख कीजिए।

Sea-floor spreading is one of the major findings of glomar expedition in 1950s. It became basis for Plate Tectonics Theory.

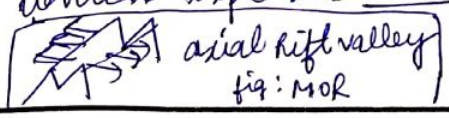
SFS is supported by various evidences put forward by Harry Hess & Dietz ⇒

⇒ SFS is seen clearly by presence of Mid-Oceanic Ridges (MORs).
eg 30,000 km long MOR (S-shaped) in Atlantic ocean.

⇒ MORs have transverse faults showing the rate of SFS is uneven.



⇒ Axial Rift valley in MORs shows Normal Fault, which explains SFS by tensile forces



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⇒ ocean floor is not featureless, presence of sea mounts & guyots shows the outward movement of these features from MORs.

⇒ Guyots have aerial erosional features, showing that once they were big in height but eroded while moving outward.

⇒ Presence of guyots, mounts trenches further proves their SFS.

⇒ Age of ocean is maximum near trenches and min near MORs, thus validating SFS.

⇒ Alternate magnetic fields along MORs with reverse polarity ridges shows SFS happened across ages.

Thus all these evidences proved SFS, which later led to Plate Tectonics Theory.

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10. Write a brief note on Earth's magnetism and its role in protecting the Earth from solar winds. **(150 words) 10**

पृथ्वी के चुंबकत्व तथा सौर पवनों से पृथ्वी की रक्षा में इसकी भूमिका पर संक्षिप्त टिप्पणी लिखिए।

Earth is a huge magnet with its magnetic north & south in opposite direction to geographic North and south pole.

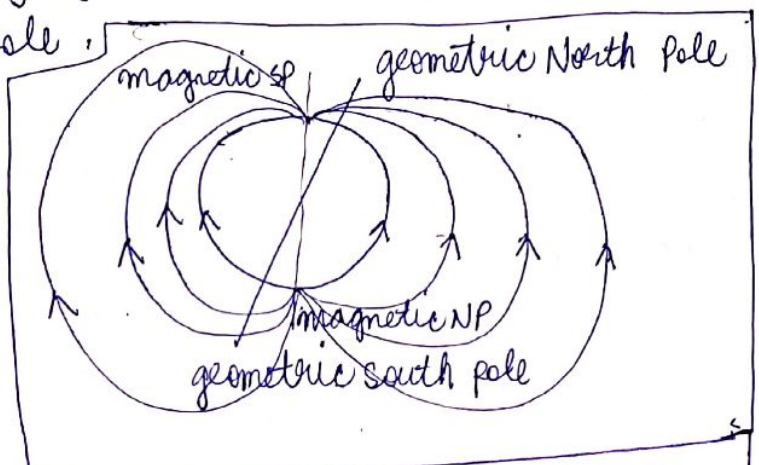

fig: magnetic & geographic NP & SP of earth

This magnetism is considered to be the consequence of inner core which is solidified and surrounded by outer liquid core, which circulates the inner core.

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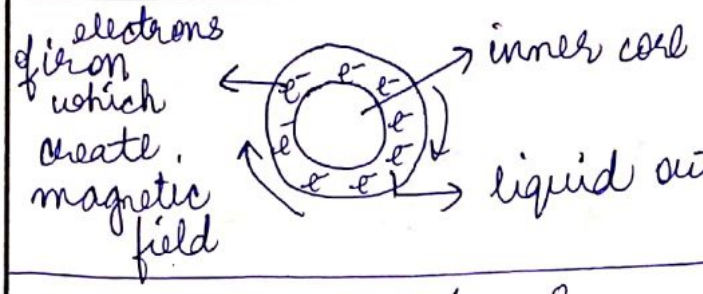

This magnetism is proved by
- → various rocks & their orientation
- → aurora borealis and australis
- → reverse magnetic lines along MORs of Atlantic ocean.

Role in protecting the earth from solar winds:

↳ This magnetism remains effective upto thousands of km above earth surface.

↳ It is considered life sustaining, as it protects our infrastructure like signals from magnetic interference.

↳ Prevents human & life existence from harmful solar winds by repelling them.

Thus, these are of utmost importance

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11. Explaining the origin and mechanism of Indian monsoon account for the uneven distribution of monsoonal rainfall in India. (250 words) 15

भारतीय मानसून की उत्पत्ति और क्रियाविधि की व्याख्या करते हुए, भारत में मानसूनी वर्षा के असमान वितरण का विवरण प्रस्तुत कीजिए।

Monsoons in India are the seasonal reversal of winds which are the consequence of interplay of various oceanic and atmospheric factors.

Origin of Indian Monsoon

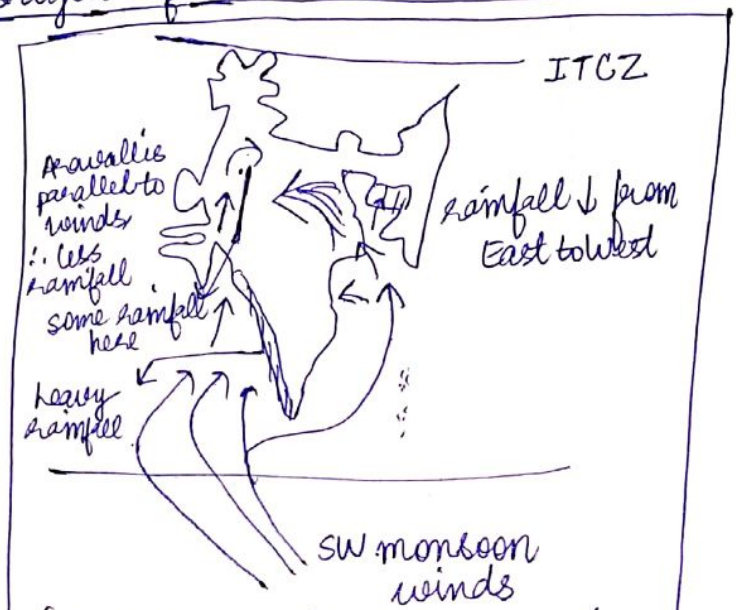

fig: Monsoonal pattern in India

Monsoons in India occur in 4 months ⇒ June-September due to the S-W monsoon winds which deflect towards India carrying moisture from Indian Ocean.

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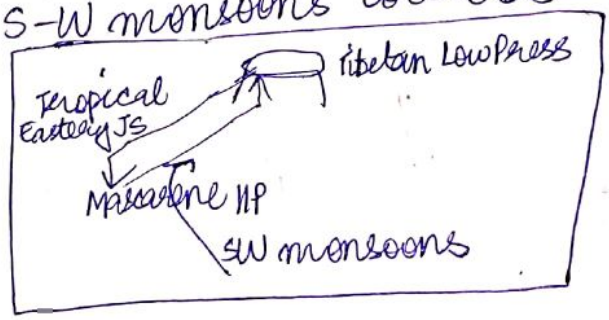
Mechanism of Monsoons:

Several factors play role in monsoons, starting from movement of Inter Tropical Convergence Zone (ITCZ) northwards.

⇓

Mascarene High Pressure forms a cell with Tibetan Low Pressure, and helps in diverting S-W monsoons towards India.



⇓

The Sub Tropical Westerly Jet Stream moves northwards, creating low pressure trough over ~~mon~~ plains

⇓

This leads to the orientation of winds

⇓

The peninsular India, breaks the winds in 2 branches → Easterly Bay of Bengal & Western Arabian Sea branch

⇓

The process reverses in October, when SW monsoon winds retreats, & NE winds which are offshore & dry cover India.

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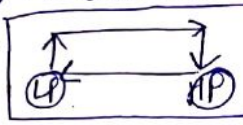
The monsoons are highly uneven both → spatially
→ temporally.

Reasons for uneven & variable nature:

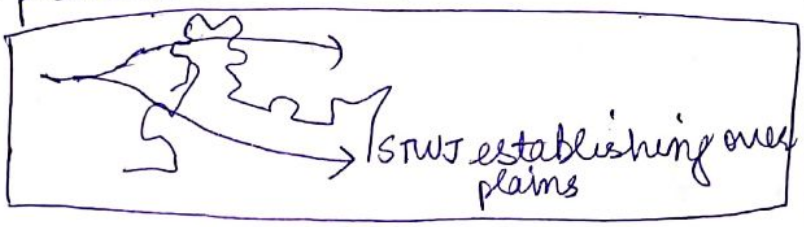
Intra-annual variations :

⇒ Moving Madden Julien oscillations (MJO)



West → East moving cell over Indian ocean.

⇒ Break in monsoons due to southward shifting of ITCZ and STWJ forming high pressure over plains.



Inter-Annual variations :

⇒ El-Nino currents causing low rainfall

⇒ Indian ocean dipole → +ve : More rainfall
→ -ve : Low rainfall

⇒ snowfall over Tibet ⇒ low pressure weakens ⇓ low rainfall

Climate change is further leading to delayed bursts and more variations in monsoonal patterns in India.

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12. How does climate change affect the process of desertification? (250 words) 15

जलवायु परिवर्तन मरुस्थलीकरण की प्रक्रिया को किस प्रकार प्रभावित करता है?

Desertification is a process of land degradation, where it loses its soil capacity and is rendered useless for any kind of agricultural or productive activity.

Desertification is an ever-increasing phenomena in the wake of climate change. The major processes or agents of desertification are: water erosion, devegetation, wind erosion ⇒ all these amplified further by climate change

Role of Climate change in Desertification

Climate change is manifested by
- temperature increase
- droughts
- heat waves & dust storms
- rainfall variability
- ice melting & barren landscapes

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• with rising haphazard & unplanned urbanisation, urban heat island effect has occured. This has led to changing hydrological cycles and temperature rise.

eg. Desertification process extending in Delhi from Aravallis.

• Dust storms are both cause and consequence of desertification.

• Large scale deforestation has led to poor landscape of the forests and with long term climate change affects.

• strong planetary winds are changing orientation & direction, leading to rise of extension of desert regions.

eg Saudi desert extension.

• Climate change has led to water scarcity, thus soils

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becoming saline and alkaline and rendering the land useless.

Desertification is a global challenge, with 30% of Indian land facing desertification. Thus, the promises of Bonn Challenge Pledge of 150 mha of forests by 2030 and land degradation neutrality must be followed in letter and spirit. This will be in consonance with SDG 15.

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13. Give an account of landforms that are shaped by running water as it erodes, transports and deposits sediments. (250 words) 15

प्रवाहित जल द्वारा अपरदन, परिवहन और तलछटों के निक्षेपण के कारण निर्मित भू-आकृतियों का ब्यौरा प्रस्तुत कीजिए।

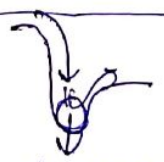
Running water is an active agent of denudation. By processes of saltation, hydrolysis, attrition, chemical disintegration; it changes the shapes of landforms.

Landforms of running water as it erodes:

⇒ Rivers in their youthful stage and hilly areas, have high erosive energy.

⇒ They erode the mountain summits by head erosion, and deepen the valleys creating plunge pools, cataracts etc.

creation of valleys



plunge pools on river bed

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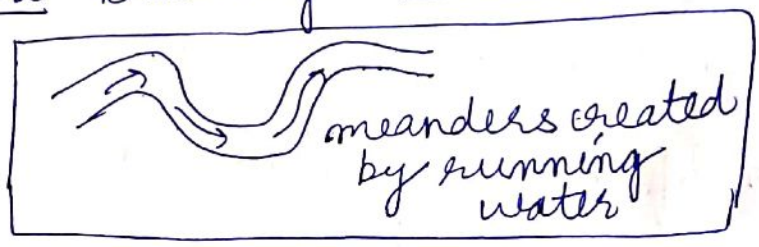
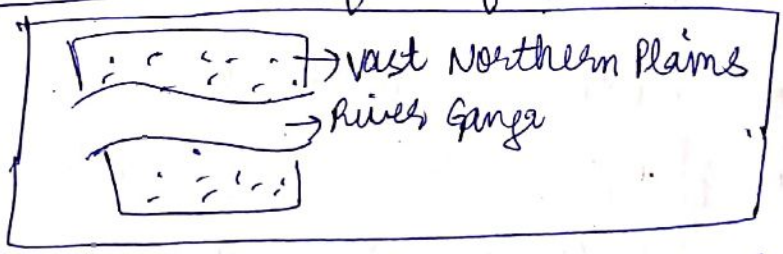
Landforms shaped by river as it transports:

⇒ while transporting sediments, river/moving water often wavers creating meanders.



⇒ Vast flood plains are created when some of the sediments get deposited or after floods.



⇒ while transporting, energy is lowered, thus valley deepening becomes less, leading to U shaped valleys.

V → U valley shape.

more erosion less erosion

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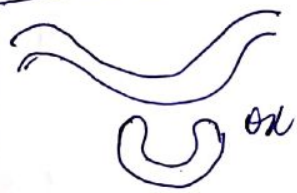
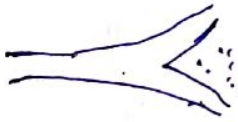
Landform shaping by running water as it deposits:

⇒ Deposition starts when running water loses its energy & reaches almost base level.

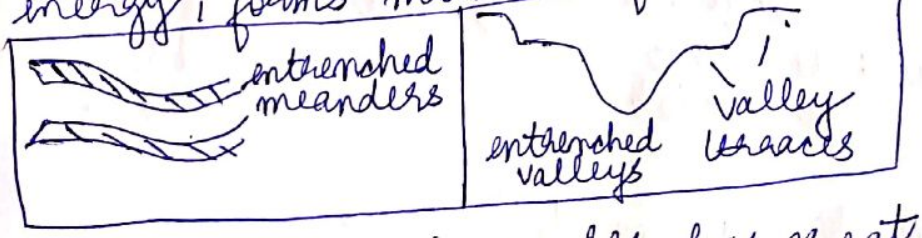
⇒ 
ox bow lakes are created, as meandering breaks

⇒ 
creation of riverine islands, → deltas by deposition

eg Majuli Island on Brahmaputra, Ganga, Mahanadi delta etc.

⇒ Braiding channels form chars or sandy depositions.

Running water, with change in energy, forms more landforms like:



Thus, running water has great potential in shaping landforms, all of this called as exogenetic process.

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14. India is vulnerable to a large number of natural as well as man made disasters on account of its geo-climatic and socio-economic conditions. Elaborate. **(250 words) 15**

भारत अपनी भू-जलवायु एवं सामाजिक-आर्थिक परिस्थितियों के कारण वृहद संख्या में प्राकृतिक के साथ-साथ मानव-निर्मित आपदाओं के प्रति सुभेद्य है। सविस्तर व्याख्या कीजिए।

According to UNISDR report,

- India has largest number of population vulnerable to displacements due to disasters
- India is 3rd largest country prone to disasters.

This explains the vulnerability of India to a large no. of disasters, both :

- Natural
  - Rapid : floods, Earthquakes
  - Slow : drought desertification
- Man made
  - slow : pollution
  - rapid & invisible : chemical leaks, industrial disasters

Disaster can be defined as =

$$\boxed{\frac{\text{Hazard} \times \text{Vulnerability}}{\text{Capacity}}}$$

Thus, India is both hazard prone & highly vulnerable too.

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Disaster vulnerability on account of geo-climatic conditions:

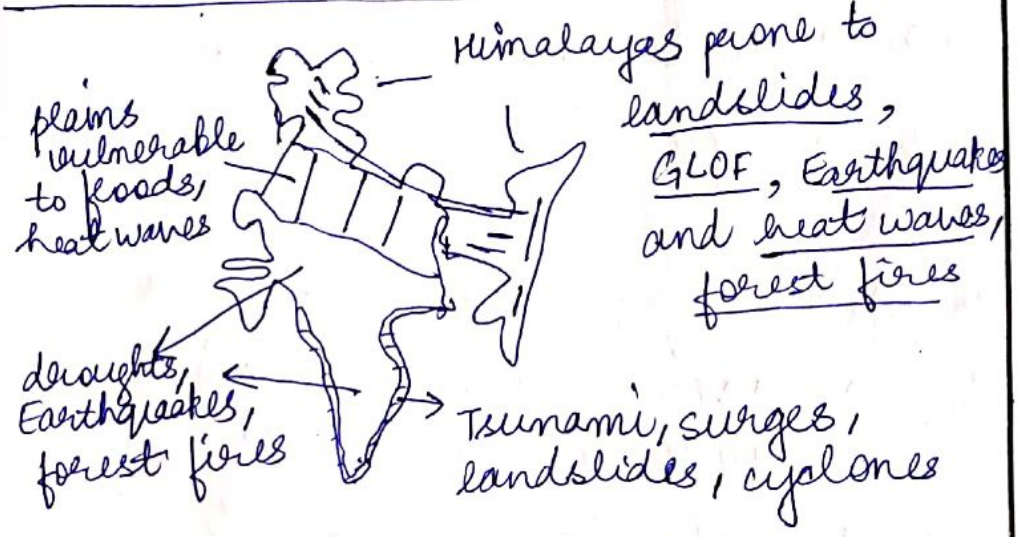

fig: spatial hazard prone & vulnerable regions

⇒ Monsoon variability and climate change impacts have led to increased frequency of floods, droughts.

⇒ None of India is in safe seismic Zone I.

⇒ India faces all kinds of disasters of mountains, rivers, oceans, deserts and plateaus because of its wide diversity.

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Vulnerability because of socio-economic conditions:

⇒ Due to population pressure & haphazard urbanisation, our ecological footprint has increased, eg. encroaching Cocum & Adyar rivers in Chennai led to floods.

⇒ Due to 25% of world's poor population, we have large economic vulnerability.

⇒ Social vulnerability is seen in exploitation of women, children & disabled during disasters.

⇒ Lack of capacity building of slum areas, rural areas & tribal areas.

Thus, disaster risk reduction calls for capacity building at all levels to reduce vulnerability.

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15. Discuss the need for mainstreaming disability perspective in the efforts towards disaster risk reduction. Also, suggest some measures that can be taken towards Disability-inclusive Disaster Risk Reduction. **(250 words) 15**

आपदा जोखिम न्यूनीकरण के प्रयासों की दिशा में निःशक्तता संबंधी परिप्रेक्ष्य को मुख्यधारा में समाविष्ट करने की आवश्यकता पर चर्चा कीजिए। साथ ही, निःशक्तता-समावेशी आपदा जोखिम न्यूनीकरण की दिशा में अपनाए जा सकने वाले कुछ उपायों का सुझाव दीजिए।

Disaster risk reduction can be holistic only when the needs and challenges of the most needy are satisfied.

Need for mainstreaming disability perspective in DRR:

⇒ The most affected victims of disasters are the disabled or Divyangjans.

⇒ They face special challenges in form of

- → lack of mobility
- → generally neglected by society
- → lack of financial autonomy
- → poor physical robustness
- → inability of decision making power

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⇒ In post-disaster scenarios, disabled people are victims of abuse, exploitation and trafficking.

⇒ Disaster risk reduction aims at community involvement, thus perspective of disabled will make the process more fool-proof, robust and successful.

Measures towards Disability-inclusive disaster risk reduction

⇒ To make the process more inclusive, NDMA should frame special policies and provisions for divyangjans.

⇒ Inclusion of divyangjans in the planning committees at district, state and national level.

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⇒ NDRF be trained ~~to~~ in rescuing the divyangjans.

⇒ Developing such technology in communication that helps the ~~po~~ people to understand in braille scripts.

⇒ Rescue & Relief centres specially for divyangjans.

⇒ Special vulnerability mapping keeping them in mind.

⇒ Inclusion of divyangjans in regular drills, standard operating procedures.

Thus, it is our duty to take their extra care and empower them for such emergency situations.

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16. Explain the causes and consequences of sea level rise. (250 words) 15
समुद्र के जल स्तर में वृद्धि के कारणों एवं परिणामों की व्याख्या कीजिए।

Sea level rise is one of the phenomena of climate change that has occured across the climatic history of earth. Current sea level rise is due to anthropogenic reasons, unlike the natural reasons of previous time scales.

Causes of sea level rise:

- → Eustatic changes due to subsidence or emergence of land mass.
  - eg WG subsidence has led to slight sea level rise.
- → Climate change reasons:
  - → Expansion of water due to warming of waters
  - → addition of freshwater by

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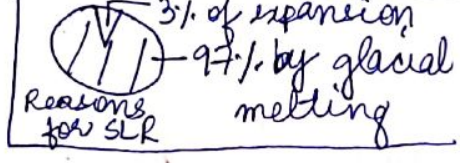
glacial melting.



with the current rate of temperature rise, it is estimated that water will rise upto 1metre by the end of century.

Consequences of sea level rise

1. Submergence of low lying coastal areas and islands.

eg Vanuatu, Tuvalu, Maldives islands are facing maximum threat

Bangaram Atoll of Karali-I of Lakshwadeep subsided recently.

2. Various fringing coral reefs will die due to increased temperature and sea level rise.

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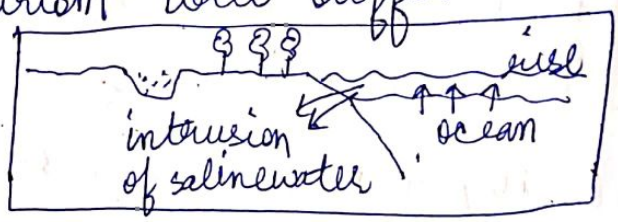
3. Temperature induced sea level rise will lead to further degassing of carbon dioxide, affecting flora & fauna.

4. Various livelihoods like fishing, brackish water aquaculture, tourism will suffer.



5. Incidences of cyclones, Tsunami and other meteorological disasters will increase.

Formation of Climate vulnerability Forum during Paris climate deal points to the fact that sea level rise is a potent problem that needs immediate attention.

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17. Highlight the factors responsible for occurrence of heat waves and its effects on life and economy. In the light of recent guidelines given by NDMA, describe measures to reduce the negative impact of heat waves. (250 words) 15

हीट वेव की घटना हेतु उत्तरदायी कारकों तथा जीवन एवं अर्थव्यवस्था पर इसके प्रभावों को रेखांकित कीजिए। NDMA द्वारा हाल ही में जारी किए गए दिशा-निर्देशों के आलोक में, हीट वेव के नकारात्मक प्रभाव को कम करने के उपायों का वर्णन कीजिए।

Heat waves are defined as the high temperatures in different regions. IMD sets the temperature targets for heat waves as:

- on plains → 40°C and above
- on coastal areas → 37°C & above
- on hilly regions → 30° C & above,

Reasons for heat wave occurence

Natural

- high convective winds before monsoon onset
- seasonal winds like loo cause heat waves
- delayed monsoons

man-made

- urban heat island effect
- high population density
- deforestation
- encroachment of wetlands
- land use changes

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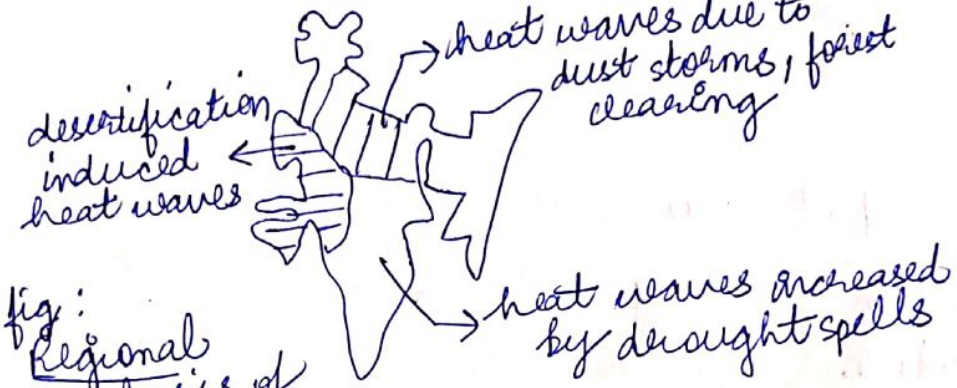

fig: Regional analysis of heat waves

⇒ Effect of heat waves on life & economy

⇒ Sudden increase in temperatures leads to fatal strokes, weaknesses of both humans & animals.

⇒ Loss of endemic sensitive biodiversity
eg recent heat waves of North East.

⇒ heat waves lead to reduced hill tourism, dwindeling its economy.

⇒ Loss of domesticated animals, crops leads to poor agricultural productivity.

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Measures to reduce impact of heat waves:

NDMA has come up with several guidelines like

- → engagement at national, state & district level
- → appointing a nodal officer for table top exercises & drills
- → vulnerability mapping & heat action plan
- → continuous monitoring, evaluation & updation of plan.

Along with these steps,

- ⇒ heat waves be included in list of disasters.
- ⇒ Focus be on long term sustainable measures like National Green Mission, planned urbanisation & creation of water sanctuaries.

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18. Discuss the increasing need of 'disaster resilient infrastructure' in India. Mention the steps taken in this direction with specific reference to the Global Coalition for Disaster-Resilient Infrastructure. (250 words) 15

भारत में 'आपदा-प्रत्यास्थ अवसंरचना' की बढ़ती आवश्यकता पर चर्चा कीजिए। ग्लोबल कोएलिशन फॉर डिजास्टर-रेजिलिएंट इन्फ्रास्ट्रक्चर के विशेष संदर्भ में इस दिशा में उठाए गए कदमों का उल्लेख कीजिए।

Disaster resilient infrastructure refers to the robust infrastructure, both physical, social & institutional as an integral part of disaster risk reduction.

Need for disaster resilient infrastructure

⇒ India has faced economic loss of about $80bn in last 20 years due to poor infrastructure.

⇒ Resilient infrastructure leads to stronger capacity of masses in dealing with disasters.

⇒ Increasing impacts of climate change have urged us to be more adaptive & mitigative in our approaches.

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⇒ Disaster Resilient infrastructure will solve manifold problems:

- stronger control measures, technical competence and structural solutions
- improved planning, robust institutional framework, financing infrastructure & viable hazard mapping

In this regard, India has created Global Coalition for Disaster Resilient Infrastructure (CDRI) during Asian Ministerial conference on Disaster Risk Reduction in 2016.

Several steps have been taken:

⇒ PM's 10 point agenda in Delhi Declaration of 2016

⇒ Focus has already been on sustainable buildings, using ECBC of BEE, GRIHA of TERI and Green Building concept,

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⇒ climate bonds and green bonds have helped in focusing on building such infrastructure

⇒ CDRI has been developed as a knowledge sharing and capacity building platform and in mobilising funds for catastrophic bonds.

Thus, all these measures are in line with SDG9 and HABITAT-III agenda. All we need is to implement these design standards & focus on 'Building Back Better' as laid down in Sendai Framework, 2015.

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19. Give an account of the natural and man-made causes of forest fires. Highlighting the challenges associated with forest fire management in India, mention the different components of the National Action Plan on Forest Fire.

(250 words) 15

दावानल के प्राकृतिक एवं मानव जनित कारणों का विवरण प्रस्तुत कीजिए। भारत में दावानल प्रबंधन से संबद्ध चुनौतियों पर प्रकाश डालते हुए, दावानल पर राष्ट्रीय कार्य योजना के विभिन्न घटकों का उल्लेख कीजिए।

Forest fires are an increasing concern for India, as Global Forest Watch has reported an increase of 125% fires in India between 2015 - 2017.

fig: Map showing distribution of forest fires in India

The forest fires can be due to both natural & man made

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Reasons :

Natural Reasons
- dry wind speed & direction
- friction between dry twigs
- ↓ moisture in soil & air
- lightning
- droughts, delayed monsoon

man made reasons
- replacing broad leaved trees with chir pine
- wetlands covered
- intentional & accidental fires
- Jhum cultivation

Challenges associated with Management

↳ The earlier scheme of Intensification of Forest fire Mgmt lacked clarity and people participation.

↳ Most of the measures have been ad-hoc and in some response.

↳ lack of culture of preparedness & prevention

↳ poor technological use.

Recent National Action Plan for Forest Fire and Forest Fire Prevention & Management Scheme

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have tried to fill in the lacunae.

↳ given a structured organisational framework of involving state forest departments.

↳ intensive use of technology like GIS mapping, infrared mapping & other tools required to put off fire and forecast fires.

↳ People participation, training of all stakeholders.

The plan is made for short term & long term goals. Thus with sustainable afforestation and densification of open forests, such fires can be prevented in wake of climate change.

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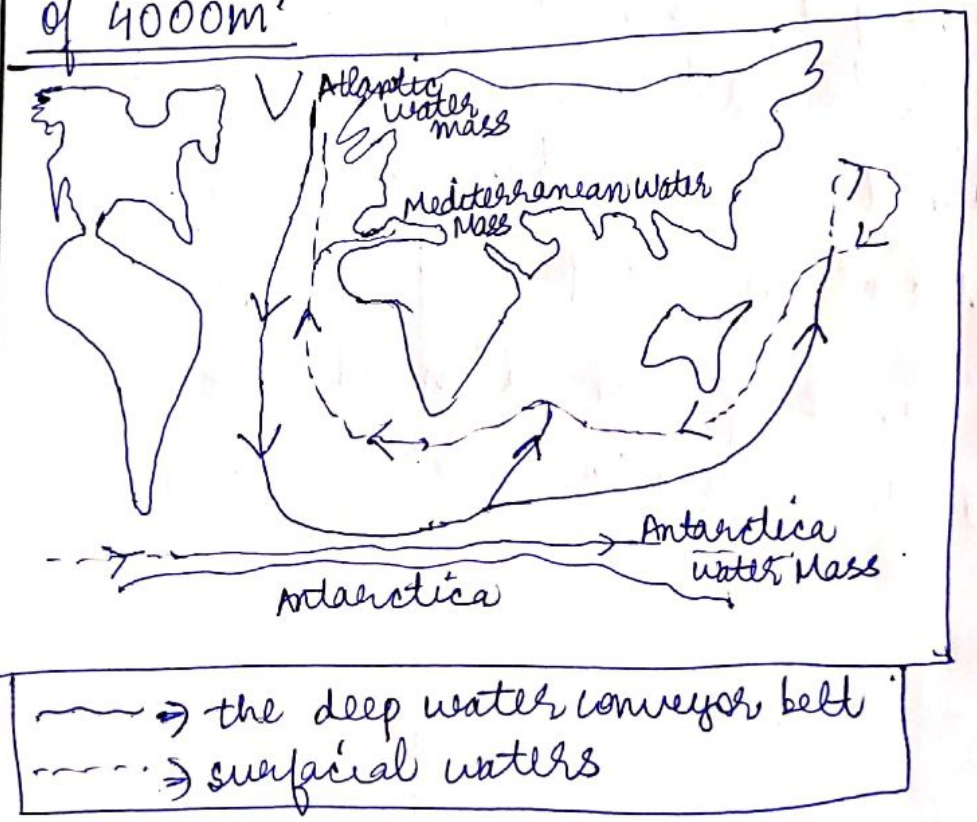
20. What is the global ocean conveyor belt? Discuss its significance for marine ecosystem. **(250 words) 15**

वैश्विक महासागर कन्वेयर बेल्ट क्या है? समुद्री पारिस्थितिकी तंत्र के लिए इसके महत्व की विवेचना कीजिए।

global ocean conveyor belt refers to the thermohaline circulations of water masses that covers the globe. This belt moves from surface ocean water to intermediate (400 m-1000 m) depths and also to deeper depths of 4000m.



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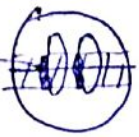
This conveyor belt is a result of brine rejection and subsequent densification of water at polar regions. As the water sinks & moves, it comes up as upwelling water in primarily tropical eastern regions and moves back to source regions, thus completing the belt.

Significance for marine ecosystem:

⇒ The upwelling zones of these circulations help in bringing nutrient rich cold water.

These are upwelling regions ←  eg Anchovian fishes in Peru feed on these nutrients

⇒ The benthic ecosystem gets desired oxygen & nutrients

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due to the mixing of waters.

→ This belt helps in transferring energy, preventing the stratification of water, thus help in blooming marine ecosystem.

Lately, these circulations are weakening on account of climate change and sea level rise. This will have catastrophic impacts and must be prevented at all costs. This will be in consonance with SDG 14 of oceans.

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GENERAL STUDIES (TEST CODE : 1404)

Name of Candidate	GUNJAN SINGH		
Medium Eng./Hindi	ENGLISH	Registration Number	125597
Center		Date	10/7/2020

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
7	10	
8	10	
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11	15	
12	15	
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16	15	
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18	15	
19	15	
20	15	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
   उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न–पत्र कोड, विद्यार्थी क्रमांक आदि)।
2. There are **TWENTY** questions printed in **ENGLISH & HINDI**
   इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
3. **All questions are compulsory.**
   सभी प्रश्न अनिवार्य हैं।
4. The number of marks carried by a question/part is indicated against it.
   प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other that the authorized one.
   प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न–सह–उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
6. Word limit in questions, if specified, should be adhered to.
   प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
   उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।

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Plot No. 857, 1st Floor, Banda Bahadur Marg (Opp Punjab & Sindh Bank), Dr. Mukherjee Nagar Delhi- 110009

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EVALUATION INDICATORS

1. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

For Gunjan Singh(thegunjansingh@gmail.com)

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1. Biosphere reserves promote solutions reconciling the conservation of biodiversity and its sustainable use. Discuss. (150 words) 10

जीव मंडल निचय, जैव विविधता संरक्षण और इसके संधारणीय उपयोग के मध्य सामंजस्य स्थापित करने वाले समाधानों को बढ़ावा देते हैं। चर्चा कीजिए।

Biosphere reserves are one of the approaches of 'in situ conservation' of specific keystone and endangered species, as well as focuses on holistic habitat based conservation approach.

Importance of Biosphere Reserve is manifold. Biosphere reserves, by their ~~var~~ very structure strike balance between conservation & sustainable use of biodiversity.

Biosphere Reserves as

Biodiversity conservation
- The advanced version of National parks & wildlife sanctuaries.
- Huge size gives a larger habitat region.

eg Nilgiri Biosphere Reserve has Nagarhole Wildlife sanctuary, Bandipur National Park, silent Valley National Parks combined

sustainable use
- Participation of people with restricted activities clearly defines the importance of each stakeholder.
- Tourism in the buffer zone.

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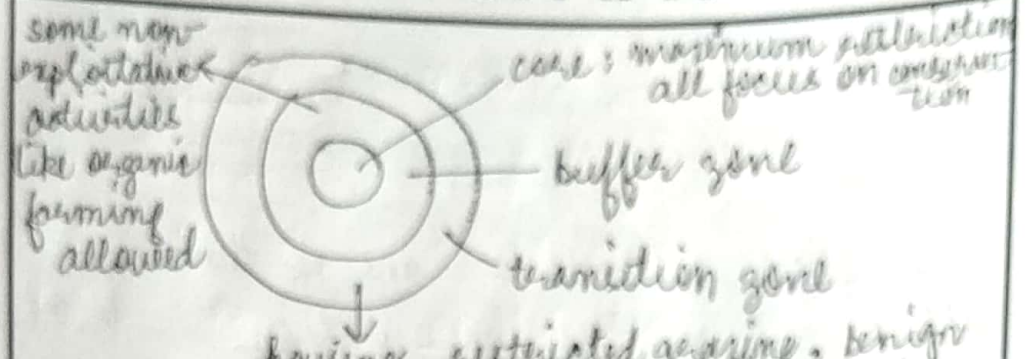

fig: structure of biosphere reserves.

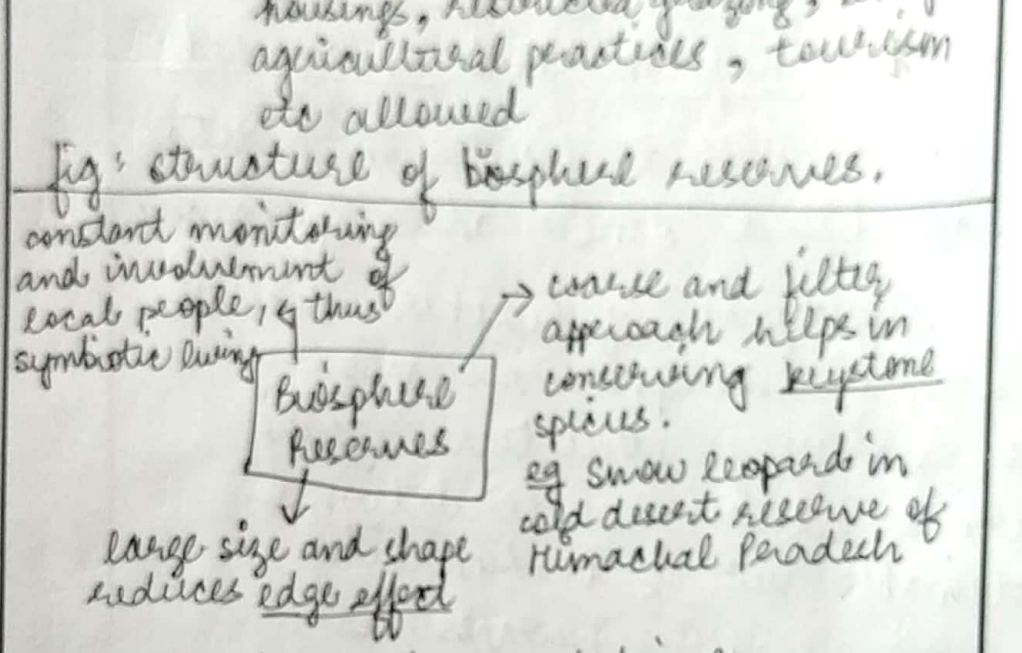

fig: Various features of biosphere reserves

wildlife conservation program (2017-2031) has acknowledged the landscape based approach of biosphere reserves. we have currently 18 such reserves and there is need to further emulate such co-habitations for our sustainable development.

X ———— X

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2. Fertilizers have been one of the key inputs in the agricultural sector since Green Revolution in India. In this context, give an account of distribution of fertilizer industry in India. (150 words) 10

भारत में हरित क्रांति के बाद से, उर्वरक कृषि क्षेत्रक का एक प्रमुख आदान (इनपुट) रहे हैं। इस संदर्भ में, भारत में उर्वरक उद्योग के वितरण का विवरण प्रस्तुत कीजिए।

Fertiliser industry forms one of the 8 core industries of India, because about 50% of population is involved in agriculture in India.

The distribution of fertiliser industry depends mainly on the source of raw material for the fertilisers.

Distribution of fertiliser industry across time & space:

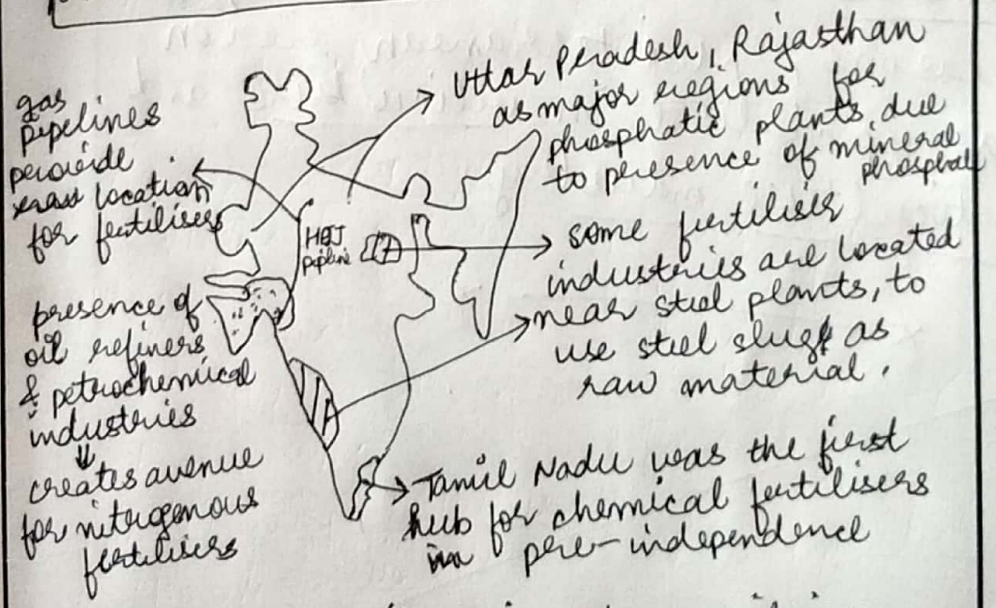

fig: Distribution of fertiliser industries

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Reasons for distribution:

⇒ Natural gas sources provide feedstock for fertiliser plants.

⇒ Fertiliser plants in the coastal states like Andhra Pradesh, Karnataka, Tamil Nadu also provides for port facilities

⇒ 70% of nitrogeneous plants are near the oil refineries and pipline infrastructure.

With green Revolution, demand for fertilisers has increased manifold and India is still largely dependent on imports. With more PSUs, joint ventures, and private participation, we can achieve self sufficiency, and also with a suitable mix of organic fertilisers, we can further reduce dependence on imports.

x ——— x

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3. Given the adverse effects of light pollution, urgent steps are required to tackle it. Analyse. (150 words) 10

प्रकाश प्रदूषण के प्रतिकूल प्रभावों को देखते हुए, इससे निपटने हेतु तत्काल कदम उठाए जाने की आवश्यकता है। विश्लेषण कीजिए।

Increasing urbanisation and industrialisation has given rise to a new form of pollution – light pollution. It is the excessive, inappropriate and wasteful use of light which starts altering with natural ecological and human processes.

Adverse effects of light pollution

↳ The greatest impact is on fauna – birds and animals.

Impacts on fauna:
- Impacting on breeding patterns
- nocturnal species worse affected.
- altered migration patterns affecting their diurnal & hibernation cycles.

↳ Light pollution is also causing energy crisis and even greater pressure on fossil fuels

↳ Impacting astronomical research activities due to interference with night starry lights.

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↳ Also has affected sleep patterns & cycles of humans, a major reason for stress.

In such devastating impacts, we urgently need to tackle the issue.

↳ Focusing on daylight saving techniques which is practised in temperate regions.

↳ Demarcating sensitive areas like National parks etc, where no light emitting infrastructure upto a certain range.

↳ Minimising & regulating 'night-life' tourism & adventures in such areas.

↳ Moving towards greener forms of energy, like solar street lights.

↳ Using sensors, where light intensity adjusts according to the movement of people.

Thus adequate & urgent steps like switching off lights of major industrial & software parks in megacities at nights can be powerful solutions towards tackling light pollution.

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4. Temperate regions are more favorable for fishing in comparison to tropical regions. Explain. (150 words) 10

उष्णकटिबंधीय क्षेत्रों की तुलना में शीतोष्ण कटिबंधीय क्षेत्र मत्स्य-ग्रहण हेतु अधिक उपयुक्त हैं। व्याख्या कीजिए।

Temperate regions ~~to~~ have well suited conditions for fishing as compared to tropical regions. These conditions can be divided into 2 broad categories :

Natural Reasons :

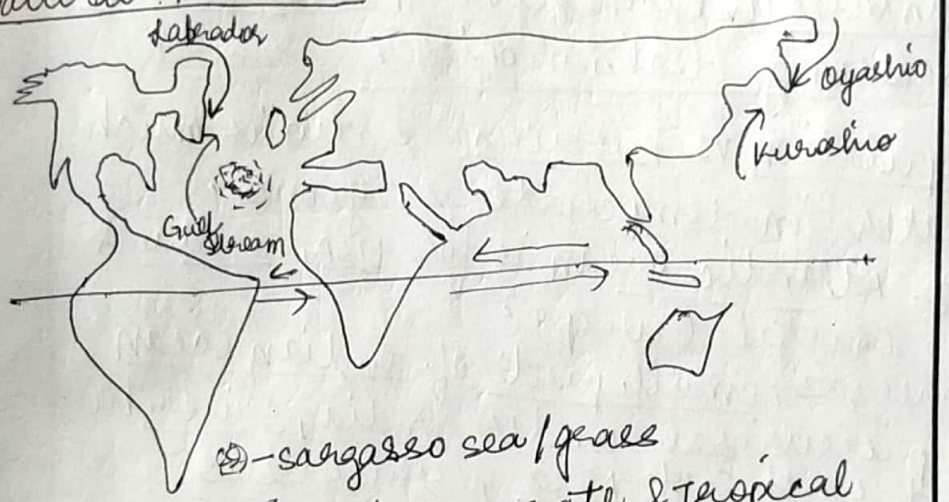

fig: conditions of Temperate & Tropical regions

↳ Temperate regions have mixing of currents (cold & warm), thus better fishing grounds. eg Newfoundland, Japan etc.

↳ Broader continental shelf of Atlantic Ocean and various archipelagos of Pacific season, give enough breeding grounds for fishes & plankton growth.

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↳ Formation of gyres in temperate regions which accumulate planktons.
eg Sargasso sea in Atlantic ocean.

↳ Moderate temperature conditions gives impetus to variety of marine life.

Anthropogenic Reasons:

↳ Temperate regions has developed countries which have better storage, processing technologies.

↳ Population vs resource ratio is much better in temperate regions.
eg Atlantic ocean is for USA, Canada & coastal Europe.
whereas, small part of Indian ocean is pressurised under India, Sri Lanka and South East Asia, thus less recuperation time for fish.

↳ Lack of agriculture & overdependence on fish for protein in temperate regions is another reason for its development.
yet, tropical regions like India, China are developing their fishing potential & are greatest production countries at present. All we need is to focus towards sustainable fishing.

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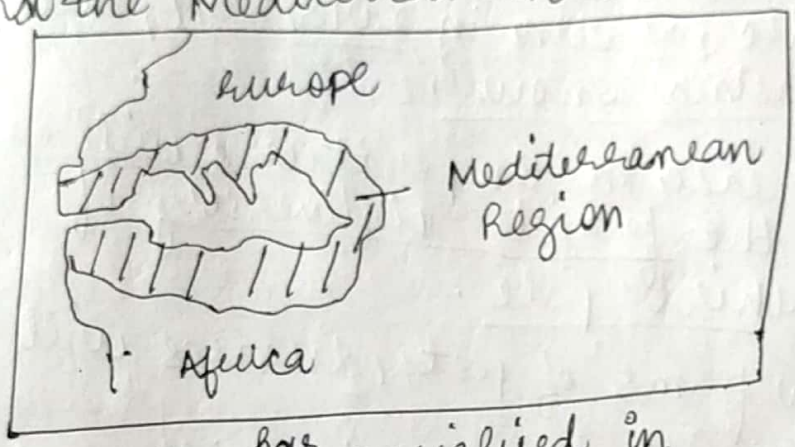
5. Explain the reasons behind development of horticulture and wine industry in the Mediterranean region. (150 words) 10

भूमध्यसागरीय क्षेत्र में उद्यान कृषि और मदिरा उद्योग के विकास हेतु उत्तरदायी कारकों को स्पष्ट कीजिए।

Mediterranean region includes the parts of Europe and North Africa around the Mediterranean sea.



This regions has specialised in horticulture & wine industry because of several reasons:

↳ Specific climatic conditions of Mediterranean → winter rainfall, long dry summers and moderate temperature conditions have led to suitable growing conditions for grapes, olives, figs and vit-C rich fruits.

↳ Developed nature of European countries led to early establishment of organised

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industries of wine.

↳ Demand for market gardening in Europe due to lack of fertile lands.

↳ Presence of longitudinal valleys of Alps gives suitable conditions for grapes and fruits orchards.

↳ Improved connectivity and inter-linkages within the European region keeps up demand for perishable goods.

Thus with these specific natural, climatic and socio-economic reasons, Mediterranean region has specialised in viticulture and horticulture industry.

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6. Analyze the impact of climate change on the third pole of the world.

(150 words) 10

विश्व के थर्ड पोल (तृतीय ध्रुव) पर जलवायु परिवर्तन के प्रभाव का विश्लेषण कीजिए।

climate change has started to grave impacts on all fragile ecosystems including the third pole of the world, i.e. the Himalayan glaciers and snow peaks system.

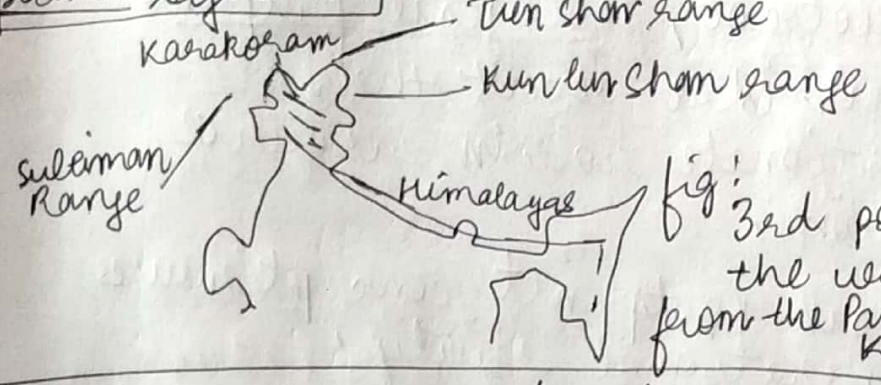

fig: 3rd pole of the world from the Pamir knot.

Impacts are manifold;

↳ Rapid melting of glaciers is responsible for catastrophes like glacial lake outburst floods, floods in the major rivers - Ganga, Indus, Brahmaputra etc.

Between 2003-09, 175 giga tons of himalayan glaciers have melted, the highest in history.

↳ Increasing temperatures will cause positive feedback on albedo & melting, thus even more glacier loss.

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climate change → ice melting → albedo decreasing
↓
further heating increase
↓
more melting → disasters → climate change

fig: Positive feedback in operation

↳ western disturbances will become erratic, as seen in 2018, 2019, thus decreasing snowline.

↳ Increase in temperatures will affect the fragile biodiversity of the third pole.

↳ New forms of pests, diseases will occur.

↳ Hydropower generation will slow down by 3% for every 1% decrease in stream flow.

↳ Long term scarcity of water & emergence of water crisis in the Indian subcontinent.

↳ sea level rise will amplify.

↳ socio-economic impacts like decreased tourism will impact livelihood on large scale.

Thus, Paris Deal, National Mission for Himalayas under NAPCC are all the much needed steps of the present.

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7. The concept of ecological footprint is a useful indicator for assessing progress on the sustainable use of resources in a country. Explain.

(150 words) 10

किसी देश में संसाधनों के संधारणीय उपयोग पर हो रही प्रगति का आकलन करने के लिए इकोलॉजिकल फुटप्रिंट की अवधारणा एक उपयोगी संकेतक है। व्याख्या कीजिए।

From exploitative economic growth we are shifting towards overall development, intra- and inter-generational equity with sustainable use of limited resources.

One of the useful indicators for assessing progress on sustainable use is — ecological footprint. It is the human interference with the nature for economic growth.

How ecological footprint is a useful indicator?

↳ It gives information about human activities that alter natural environment.

eg Amazon fires, dead zones in oceans all are manifestations of very high ecological footprint.

↳ It gives impetus towards shifting

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to green renewable energy sources.

↳ Measures like Earth overshoot day or country overshoot day gives an assessment about the rate of exploitation of natural resources.

↳ For countries like Annexe I of Kyoto Protocol, ecological footprint gives a clear idea about their disproportionate role in resource exploitation.

↳ Ecological footprint concept ensures inter-generational equity.

Thus, incorporating this concept in carbon credits, carbon emissions, green GDP and CDM measures will help us mitigate the challenges of climate change in a holistic manner.

This is the need of hour.

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8. Explaining what peats are, examine why emphasis is being given to sustainable management of peatlands worldwide. (150 words) 10

यह स्पष्ट करते हुए कि पीट क्या हैं, परीक्षण कीजिए कि विश्व भर में पीट-भूमियों के संधारणीय प्रबंधन पर क्यों बल दिया जा रहा है।

Peats are the partially decomposed plant matter in a water-saturated region. It is also considered as ~~the~~ a cheap quality of coal fuel.

Brazzaville declaration, Peatlands Initiative etc have emphasised on sustainable management of peatlands worldwide. These are present in ~~perf~~ permafrost as well as tropical rainforest regions, hence their conservation becomes utmost necessary.

↳ Peatlands store the maximum amount of carbon as compared to forests.

↳ They regulate hydrological cycle, and are sinking grounds for lots of minerals & nutrients.

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↳ They are house for distinct flora and fauna, as well as many migratory species.
eg tigers, elephants, huge mammals of Africa, all have habitats around peatlands.

↳ They provide livelihood support to local population, through cultivation of specific vegetables and fruits. eg berries, mushrooms etc.

Thus for these reasons and their vast areal extent, it is important to manage these 'keystone ecosystems' which have developed specific habitat around them.

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9. The CRZ Notification, 2018 aims to maintain a balance between economic growth and conservation principles of coastal regions. Discuss. (150 words) 10

CRZ अधिसूचना, 2018 का उद्देश्य आर्थिक संवृद्धि और तटीय क्षेत्रों के संरक्षण सिद्धांतों के मध्य संतुलन बनाए रखना है। चर्चा कीजिए।

CRZ notification 2018 has been drafted by taking many inputs including Sailesh Nayak committee recommendations. The notification has several modifications which try to strike balance for sustainable development.

CRZ notification 2018 changes for;

economic growth

↳ promoted tourism by allowing Temporary infrastructure.

↳ No development zone decreased for heavily populated areas.

↳ Floor Space Index (FSI) restrictions defreezed.

conservation principle

↳ The zones divided in 4 parts, with maximum focus on zone 1 & 4. ~~zones~~ conservation

↳ Zone 1 and 4 projects would require clearances

↳ Ecological Sensitive Areas taken special care of.

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Thus with these modifications, CRZ notification tried to:

↳ diversify coastal livelihood besides fishing.

↳ Focus on pollution abatement projects

↳ Clear demarcation of zones according to vulnerability has eased policy making.

But certain issues remain

↳ Hazard line mapping data has been delinked with the zone planning.

↳ Tourism if not monitored can create ecological disaster in future.

↳ Treatment plants may rupture fragility.

↳ Need to monitor that tourism etc doesn't pose challenge for fishing.

Thus, Sagarmala and Integrated Coastal Zone Management are our saviours and CRZ should be constantly monitored & reviewed & altered if the need arises.

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10. Highlight the need to integrate informal and formal sectors for improved waste management. (150 words) 10

उन्नत अपशिष्ट प्रबंधन हेतु अनौपचारिक एवं औपचारिक क्षेत्रकों को एकीकृत करने की आवश्यकता पर प्रकाश डालिए।

waste management has become an integrated part of circular economy and sustainable development today. It is estimated that 165mn tons waste will be produced by 2031, and currently:

75% waste is collected ⇒ only 22% is processed & treated.

Hence the need for integrating formal & informal sectors has risen.

↳ Informal sector constitutes 90% of waste management stakeholder, thus their formalisation will lead to better collection & processing of waste.

↳ This will end not only child labour & poor working conditions, it will also lead to trained workforce for better waste management

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↳ This will ease the burden of Extended Producer responsibility, and by creating a large third party it will utilise economies of scale.

↳ This will give impetus to waste-to energy plants, better innovation in waste management.

↳ A separate and integrated workforce for waste management will lead to entrepreneurial skills, increased capacity of municipal bodies and creation of a specialised collection and recycle economy.

Thus the guidelines of Waste Management Rules, 2016 of integrating the informal labourforce must be done quickly and in organised manner.

x——————x

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11. Identify the important mineral belts of India. Highlighting some of the issues plaguing the mining sector in India, discuss how the National Mineral Policy 2019 aims to address these issues. **(250 words) 15**

भारत की महत्वपूर्ण खनिज पट्टियों की पहचान कीजिए। भारत में खनन क्षेत्रक को समस्याग्रस्त करने वाले कुछ मुद्दों को रेखांकित करते हुए, चर्चा कीजिए कि राष्ट्रीय खनिज नीति-2019 इन मुद्दों को किस प्रकार संबोधित करने का लक्ष्य रखती है।

India is rich in various types of metallic and non metallic minerals. eg 5th largest reserves of coal are in India. Also it has rich amounts of rare-earth minerals. The major mineral belts of India are

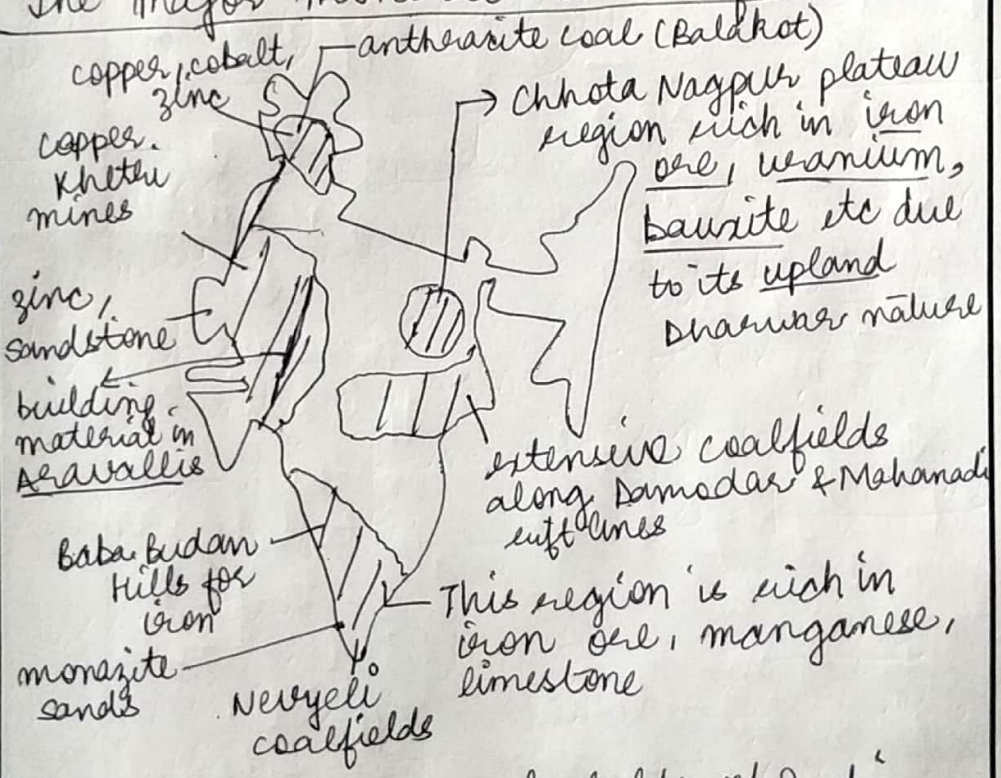

fig: major mineral belts of India

But mining sector in India is plagued with various challenges.

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↳ ① Technological Issues

Use of obsolete machinery and poor methods of mining.

eg rat hole mining for coal in Meghalaya

open shaft mining with poor productivity.

↳ ② Human rights issue

The mining areas co-incide with forests & tribal belts. Thus large scale displacement has led to deterioration of the living conditions of poor.

eg Niyamgiri revolts of odisha were against blantant displacment.

↳ ③ Environmental Issues

Poor methods of mining have led to large scale deterioration of Western Ghats, Bastar Highlands.

Deforestation, changing rivers course due to sand mining are some of the emerging challenges.

↳ ④ Illegal mining, corruption and weak administrative machinery

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Thus, National Mineral Policy, 2019 is an attempt to solve some of these problems.

↳ Utilisation of district mineral fund for equitable development of displaced people.

↳ Focus on sustainable mining with intergenerational equity concept.

↳ Checking corruption through e-governance, drone surveillance etc.

↳ To foster healthy competition, encouraging private sector through revenue sharing model and creation of dedicated mineral corridors.

↳ Harmonising taxes, levies to boost up the mining sector and make it more vibrant.

Thus, mining can help India not only have surplus raw materials, but also it can boost employment and manufacturing. Thus, the challenges must be taken care of systematically to make the best use of this sector.

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12. What is carbon pricing? Mention some of the different types of carbon pricing mechanisms. Examine how it can help India in achieving its climate commitments under the Paris Agreement. **(250 words) 15**

कार्बन मूल्य निर्धारण क्या है? विभिन्न प्रकार की कार्बन मूल्य निर्धारण क्रियाविधियों का उल्लेख कीजिए। परीक्षण कीजिए कि यह पेरिस समझौते के अंतर्गत अपनी जलवायु प्रतिबद्धताओं को प्राप्त करने में भारत की किस प्रकार सहायता कर सकता है।

carbon pricing is a method of controlling carbon emissions. It is a method that gained traction after Kyoto Protocol, and helped put a cost on carbon pollution.

There are 2 major approaches of carbon pricing:

- emission trading system / cap & trade system
  - ⇓
  - less polluting industries can monetarily benefit by selling the carbon credits to more polluting industries to fulfill their quota.
- carbon taxes
  - ⇓
  - These are applied directly on the carbon emitted by an industry. A fixed rate is applied, eg Rs400/ton of carbon in India

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India has taken ambitious targets of 175 GW of Renewable energy and reducing carbon emissions to 25%-35% of its GDP taking 2005 as base level.

Thus, carbon pricing will be a major step towards India's fulfillment of its commitments in the Paris deal.

How will it help?

⇒ It will discourage polluting industries & production processes.

⇒ Using cap and trade system, India can benefit from using eco-friendly methods.

⇒ Working on the 'polluter pays principle', it will help reduce negative externalities on environment

⇒ This green tax can help set up more energy efficient technologies.

⇒ It will help create space for more innovations and

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disruptive technologies.

⇒ This pricing can can be used to subsidise renewable energy processes

For all of these it is necessary that India institutionalises the carbon pricing mechanism along with its INDCs, so that it gets implemented in letter & spirit.

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13. Not only is the spatial and temporal distribution of freshwater in India very skewed, but also its usage inefficient and wasteful. Discuss in context of the current water crisis. **(250 words) 15**

भारत में ताजे जल का स्थानिक और सामयिक वितरण न केवल अत्यधिक विषम है, अपितु इसका उपयोग भी अकुशल एवं अपव्ययी है। वर्तमान जल संकट के संदर्भ में चर्चा कीजिए।

India has monsoon type of climate and receives 4000 BCM water annually. Yet India is on the verge of water scarcity today. current water crisis can be studied from the context of natural & anthropogenic phenomena.

Spatial and Temporal variations in freshwater distribution

↳ India receives 118-120 cm/yr water by rainfall, but that is only limited in few regions & months of the year.

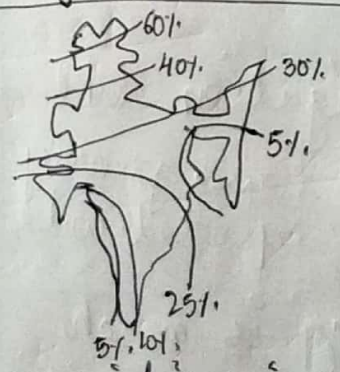

fig: variations in rainfall

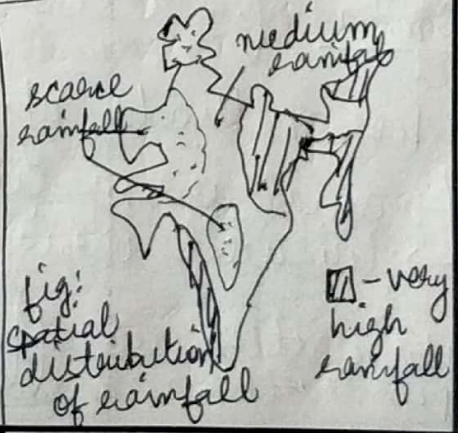

fig: spatial distribution of rainfall

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↳ Also, 60% of freshwater is contained in Ganga, Brahmaputra only, thus creating a huge spatial divide in freshwater. Godavari, Krishna, Kaveri account for only 15% of freshwater.

↳ with climate change, rainfall variations are further increasing, thus putting a huge challenge on water sources.

water crisis due to inefficient and wasteful use

↳ India being agrarian economy, has huge dependence on irrigation. Yet only 90 mn hectares of irrigation potential is utilised for 190mha of net sown area.

↳ Poor methods of irrigation like
- ↳ canal irrigation
- ↳ tubewell irrigation

] have grossly exploited water

Our water use efficiency is much poorer than many developing countries

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eg for every 1ha of irrigated cropped area, India uses 1.5 m depth of water as compared to 87 cm depth water by USA.

↳ Events like shimla water crisis have shown that soon glaciers which are major source of freshwater will extinguish soon.

↳ There is lack of tapwater connection on one hand, on the other hand huge amounts of untreated waste water gets added to freshwater sources (rivers, lakes etc)

industries, domestic exploiting freshwater → create lot of wastewater → no treatment facility → directly drain in lakes, rivers, ponds → pollute the remaining freshwater → industries, domestic exploiting freshwater

↳ Bellandur lake tragedy of Bangalore or Chennai floods due to freshwater exploitation are all signals towards impending doom that will amplify with climate change. Thus, rainwater harvesting, sponge city concept & micro-irrigation as solutions must be followed.

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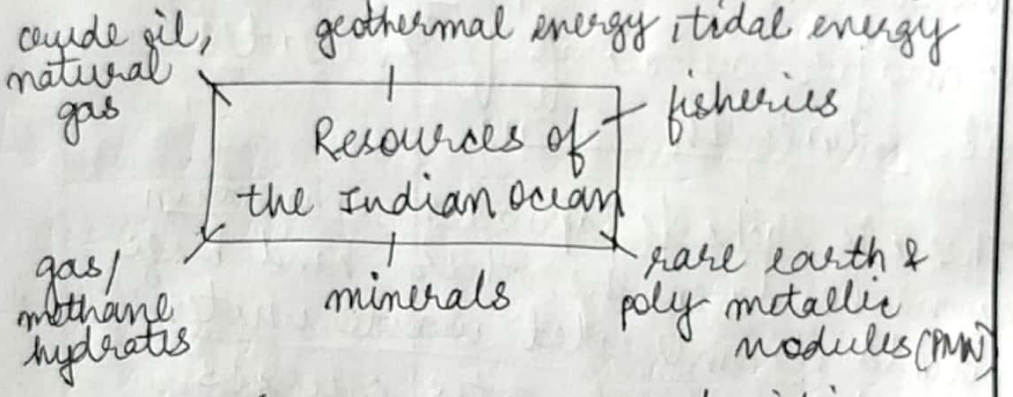
14. Discuss the opportunities and challenges for India in harnessing the resources of the Indian Ocean Region. (250 words) 15

हिंद महासागर क्षेत्र के संसाधनों का दोहन करने में भारत के लिए अवसरों एवं चुनौतियों की विवेचना कीजिए।

With about 7500 km of wide coastline, India has a strategic location & importance in the Indian Ocean Region.



India has huge opportunities in harnessing these resources:

↳ India holds 2nd place in fisheries production due to vast indented coastline.

↳ India was the ~~goo~~ first country to get permission for extracting PMN from International seabed Authority.

↳ Good relations with Japan, Germany, France has provided technical aid in extracting various minerals.

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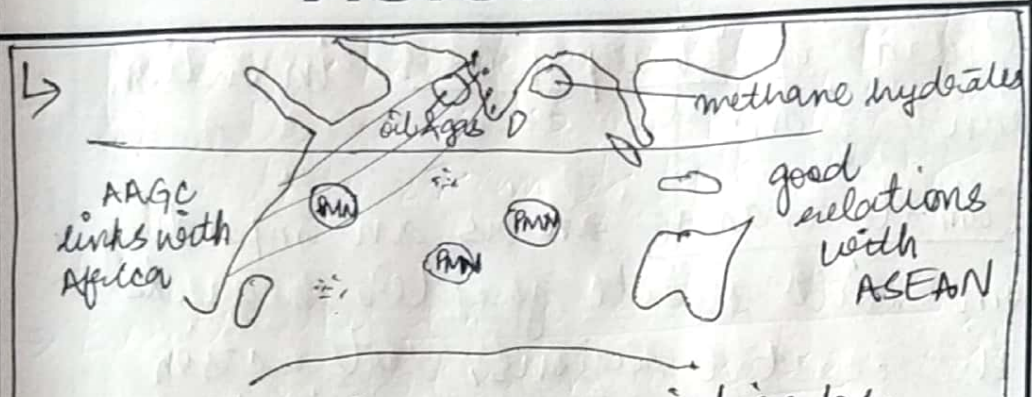

fig: various opportunities for India

↳ India holds good relations with Africa & ASEAN, thus there are opportunities for amicable sharing of benefits.

But, despite these opportunities, India faces few challenges too.

↳ In fisheries, India is at constant loggerheads with Sri Lanka in the Gulf of Mannar and Palk St region.

↳ Problems of trawling and lack of technology for deep sea fishing.

↳ China with its technological prowess is doing better than India in extracting PMN and other minerals, thus a constant challenge besides

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'its usage of 'sharp powers' in Indian ocean region.

↳ Climate change ~~an~~ as an impending doom will create greater hazards in the coastal regions, destruction of corals & other marine biodiversity

↳ Pollution from oil & gas drilling poses risks for future.

↳ Methane hydrates are still inaccessible due to technological limitations.

Thus, India has to pace up its technology and use its diplomatic capital more efficiently to not just keep Indian ocean safe, but also as a rich storehouse of resources useful for future generations. This will help us move towards our SDG 14.

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15. Examine how resource efficiency can bring about multiple benefits along the three dimensions of sustainable development - economic, social and environmental - in India. **(250 words) 15**

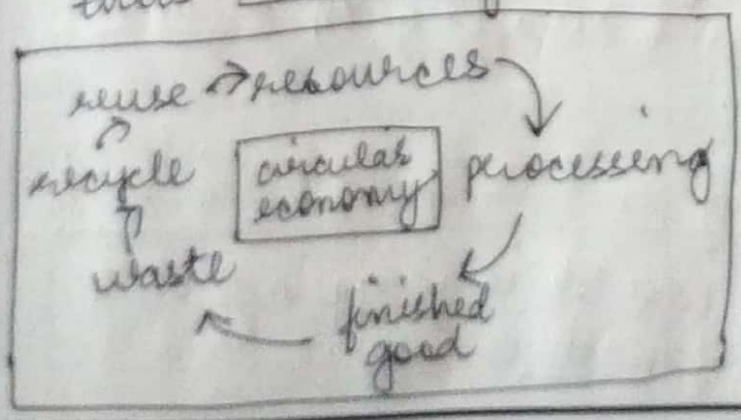
परीक्षण कीजिए कि संसाधन दक्षता, भारत में संधारणीय विकास के तीन आयामों-आर्थिक, सामाजिक और पर्यावरणीय - के साथ-साथ किस प्रकार विविध लाभ प्रदान कर सकती है।

Resource efficiency means utilising the resources in a prudent manner and focusing on reusing, recycling and reducing their use.

eg blending of ethanol in petrol is a move towards resource efficiency.
focusing towards drip irrigation etc.

Benefits along economic dimensions:

↳ It creates a circular economy, where the waste can be reused thus reducing cost of production



↳ This also creates new forms of employment

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↳ It will help integrate the informal sector, formalise them and create economies of scale.

eg reusing plastic, paper waste will create new waste to energy plants, new industries and cheaper raw materials

Benefits along social dimensions:

↳ with cheaper goods, it will be accessible to all.

↳ By reducing unemployment and diversified economy, people would come out of poverty.

↳ Much benefit to rag pickers, will help reduce child labour.

↳ Exploitation of labour, long working hours, unhygienic work conditions would be done away with organised functioning.

Benefits along environmental dimension:

↳ Today the world is grappling with waste management issues.

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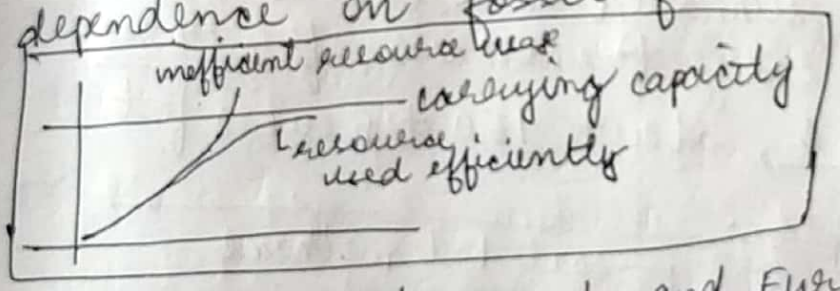
↳ India faces huge amount of liquid, solid, plastic, e-waste issues.

several problems
- air pollution
- deforestation
- improper mining and extraction
- leaching in groundwater
- fires on landfills (eg Ghazipur landfill fire)

⇓

all these problems will be resolved through efficiently managing the resources.

eg moving towards solar and biomass energy will reduce dependence on fossil fuels.



Thus, Niti Ayog's and European Union's move towards resource efficiency is a welcome steps towards sustainable development.

x ——— x

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16. Highlighting the significance of unconventional hydrocarbons for India, discuss the issues faced in their exploration and extraction. **(250 words) 15**

भारत के लिए अपरंपरागत हाइड्रोकार्बनों के महत्व पर प्रकाश डालते हुए, उनके अन्वेषण एवं निष्कर्षण में आने वाली समस्याओं की विवेचना कीजिए।

Unconventional hydrocarbons are those hydrocarbons which cannot be extracted like crude oil and natural gas. These include: coal bed methane (CBM), shale oil, shale gas, methane hydrates etc.

Significance of unconventional hydrocarbons

↳ It is estimated that India has second largest reserves of methane hydrates, about 150 trn cubic feet of shale gas.

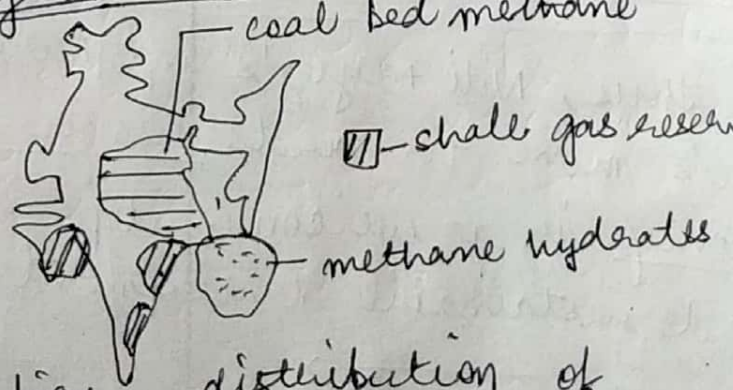

fig: distribution of unconventional hydrocarbons in India

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↳ It will reduce dependence on imports. Currently 80% crude oil is imported.

↳ It will lead to our energy security.

↳ Coal bed methane, shale gas are closely associated with coalfields, thus with improvement in extraction, we can increase our production of energy resources.

But despite this abundance, certain issues still remain.

Issues in Exploration:

↳ The data about these hydrocarbon gives an estimate and not the actual figures.

↳ Due to separate policies and lack of private players, not much effort taken in their exploration.

↳ It requires new investment in exploration & production (E&P), lack of cutting edge technology creates problems.

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Issues in Extraction:

↳ Complex methods like 'pressurised water, chemicals and sand' create issues in exploration.

↳ Requirement of water (5-9mn ltrs) is another challenge, also chances of polluting aquifers.

↳ Fracking and other technologies are not yet formalised.

Thus, to address these issues, India has moved towards HELP, where these hydrocarbons will also be covered under uniform licensing policy. With improved EIA process, involvement of private players and technology upgradation we can utilise these unconventional hydrocarbons in near future.

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17. Programmes for cleaning polluted rivers in India have been implemented for a long time, however, the results of these programmes are not very encouraging. Identify the reasons for the same and possible steps to rectify the situation. (250 words) 15

भारत में प्रदूषित नदियों की सफाई के कार्यक्रम लंबे समय से कार्यान्वित किए जाते रहे हैं, हालाँकि, इन कार्यक्रमों के परिणाम बहुत उत्साहजनक नहीं हैं। इसके कारणों और इस स्थिति में सुधार लाने के संभावित उपायों की पहचान कीजिए।

From River Ganga and Brahmaputra to small rivers like River Mithi, river pollution is one of the most daunting challenges for all of these rivers.

Several programs like Ganga Action Plan, Namami Gange, Central Monitoring Committee, National River Conservation Plan etc have been formulated but still more than 350 polluted stretches exist (2018) in India.

Reasons for the programs not working

↳ There is flaw in formulating the policies, in terms of identifying the ~~probla~~ source areas.

point source
↳ factories effluents etc

non point source
↳ agriculture etc

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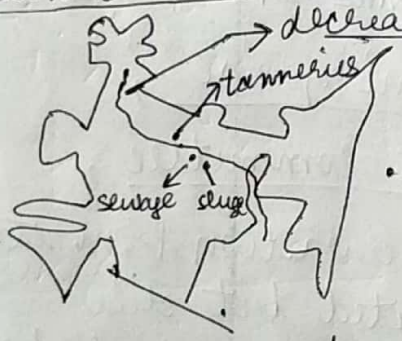
↳ lack of co-ordination at all levels - centre, state, municipality.

↳ The policies have been largely top-down, not involving the local population. This has been tried to ~~done~~ away with Namame Gange program.

↳ lack of treatment infrastructure, poor monitoring, budgetary constraints are other issues

eg.



→ decreased ecological flow in upper reaches due to dams

- Kanpur, Allahabad, Varanasi as high polluting areas

River Ganga gets polluted across the upper & lower reaches

Possible steps to rectify the situation:

↳ identify the source areas and take required action:

↳ point sources: common effluent treatment plants, sludge treatment plants with anticipated capacity.

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↳ non-point sources → stop open defecation projects like Ganga Grams be implemented in India, creating no-development zone just like CRZ rules.

→ using bioremediation techniques, aquatic plants which absorb heavy metals and facilitate river cleaning

→ Maintaining the ecological flow of rivers all across, thus going for 'run of the river' projects to prevent water shortage.

→ opting for watershed approach where local people are actively involved & incentivised.

→ use of technology like drones, sensors to map the worst polluted stretches and pinpointed actions be taken

Rivers are the core of our survival & civilisation. Their protection is our utmost requirement

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18. Ecosystem services are the direct and indirect contributions of ecosystems to human well-being. In this context, distinguish between supporting, provisioning, regulating and cultural services provided by ecosystems.

(250 words) 15

पारिस्थितिकी तंत्र सेवाएँ मानव कल्याण हेतु पारिस्थितिकी तंत्र के प्रत्यक्ष एवं अप्रत्यक्ष योगदान हैं। इस संदर्भ में, पारिस्थितिकी तंत्र द्वारा प्रदान की जाने वाली सहायक (supporting), प्रावधानन (provisioning), विनियामक (regulating) और सांस्कृतिक (cultural) सेवाओं के मध्य अंतर स्पष्ट कीजिए।

Ecosystem services are the services provided by the biosphere and its components. These services are a part of the 'natural capital'. Their direct and indirect contributions can be studied in 4 types of services provided.

Supporting services

↳ These form the base of all services, and provide habitat for all life forms.

↳ Major services include
- soil recycling
- nutrient recycling
- retaining etc. biodiversity

↳ These form part of indirect contribution of ecosystem to human beings.

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Provisioning services

↳ These are the direct benefits provided to the human beings.

↳ Here ecosystem provides food, wood, fibre, fuel, medicines, water to the humans.

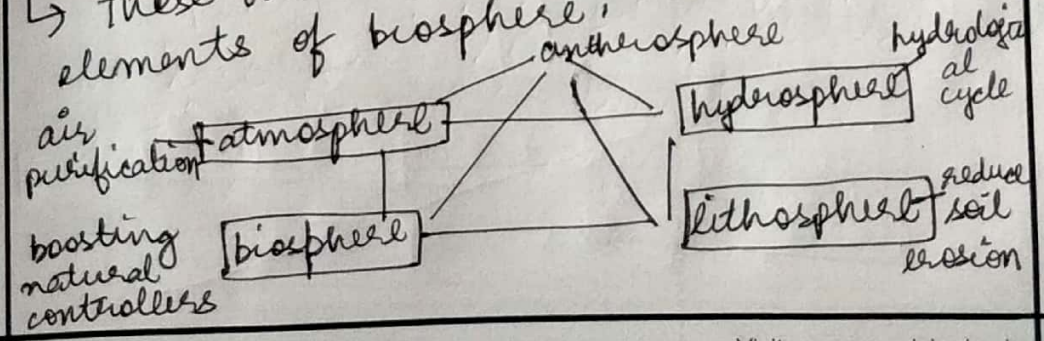
↳ These services provide immediate benefits & fulfill the basic needs of human beings.

Regulating services

↳ These are those services which create facilities for the functioning of ecosystem and maintaining balance.

↳ These services create a functional envelope for human beings' survival.

↳ These include controlling all the elements of biosphere.



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cultural services

↳ These are the services exclusively for human beings.

↳ Just by the virtue of its existence, ecosystem improves the aesthetics of a region, boosts tourism and provides direct economical benefits.

↳ sacred Groves are also providing spiritual services to human beings

Thus, 'payment for ecosystem services' and 'natural capital' helps us realise the varied potential and benefits that ecosystem has for us, we all need to strike a balance between use and conservation for our own harmonious existence.

x———x

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19. What are various phases of Environmental Impact Assessment (EIA) studies? Comment on the need for institutionalising public participation in EIA. **(250 words) 15**

पर्यावरणीय प्रभाव आकलन (EIA) अध्ययन के विभिन्न चरण क्या हैं? EIA में जन भागीदारी को संस्थागत बनाने की आवश्यकता पर टिप्पणी कीजिए।

Environmental Impact Assessment (EIA) is a process of evaluating the consequences of a project that it would have on environment and people residing in that region. EIA in India is part of Environment Protection Act, 1986.

Various phases of EIA studies:

Screening → The size of the project is evaluated and decided if it requires clearance.

↓

Scoping → Project's impacts are studied, its influence area is noted

↓

Impact & Data collection → For creating EIA reports, all the possible data & affected domains are considered.

↓

Mitigation measures → For all the possible impacts noted, mitigation steps for prevention and control are evaluated.

↓

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Public hearing → once the report is created, it is put out before the public, so that it can be debated by CSOs, people interested & affected

↓

Decision making → Keeping above all the points, final decision about the project is taken.

↓

Evaluation, monitoring → continuous risk assessment is done to check whether the project is in accordance to the report created.

In all these phases, the most effective phase is of public participation which decides the credibility of reports & projects.

Several issues in the EIA have called for institutionalisation of public participation.

Why is the need?

↳ This will improve the applicability & credibility of the report.

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↳ By institutionalisation, several experts & CSOs will become part of public hearing, which will ensure all possible dimensions are covered.

↳ Mandatory public hearing will strengthen social audit process, make people more aware of their rights & responsibilities.

↳ Data collection will become more accurate & transparent; will get verified.

↳ Fraudulent EIAs will be recognised and appropriate actions can be taken on them.

Thus, public participation forms the core of a working democracy where people don't get displaced without their will and ample remuneration is provided to them.

x —— x

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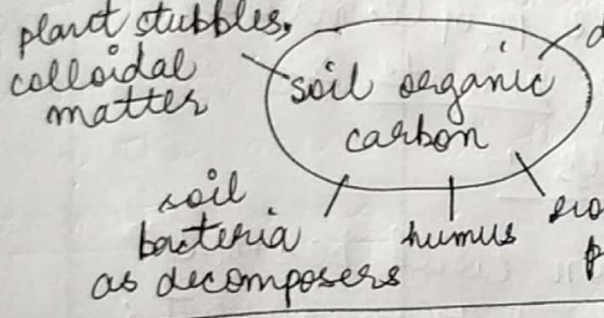
20. What is Soil Organic Carbon (SOC)? Identify various factors affecting SOC levels. Also, highlight the beneficial impacts of SOC on soil health and functionality. (250 words) 15

मृदा जैविक कार्बन (SOC) क्या है? SOC के स्तर को प्रभावित करने वाले विभिन्न कारकों की पहचान कीजिए। साथ ही, मृदा स्वास्थ्य और कार्यात्मकता पर SOC के लाभकारी प्रभावों पर प्रकाश डालिए।

soil organic carbon refers to the organic part of soil which is formed by the interaction of microbes, plants and animals.



Various factors that affect SOC levels

↳ climatic conditions : Acid regions have low carbon content. Moist, humid, warm conditions create more soil organic carbon.
eg Boreal forests, tropical rainforests have high SOC.

↳ Presence of micro-organisms, earthworms etc also control the amount of SOC.

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↳ colloidal state and soil particles size & texture also determine the amount of SOC.
eg clayey soil has less SOC than peaty soil.

↳ Human activities like monoculture, deforestation, deposition of non-biodegradable waste etc reduce SOC.

Benefits of SOC on soil health & functionality:

↳ Improves the fertility of soil by increasing the required micro-nutrients.

↳ Improves soil structure, porosity and water retention capacity of soil.

↳ By storing carbon, soil improves the crop & vegetation yield also.

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↳ High SOC regions like peatlands, forest soils, permafrost also are huge reservoir of GHGs.

↳ They help in recharging aquifers.

Thus, with these importance, there is a wide requirement for protecting & preserving soil organic carbon. This has become imperative all the more in the wake of climate change.

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